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Vol. 944 Number 5

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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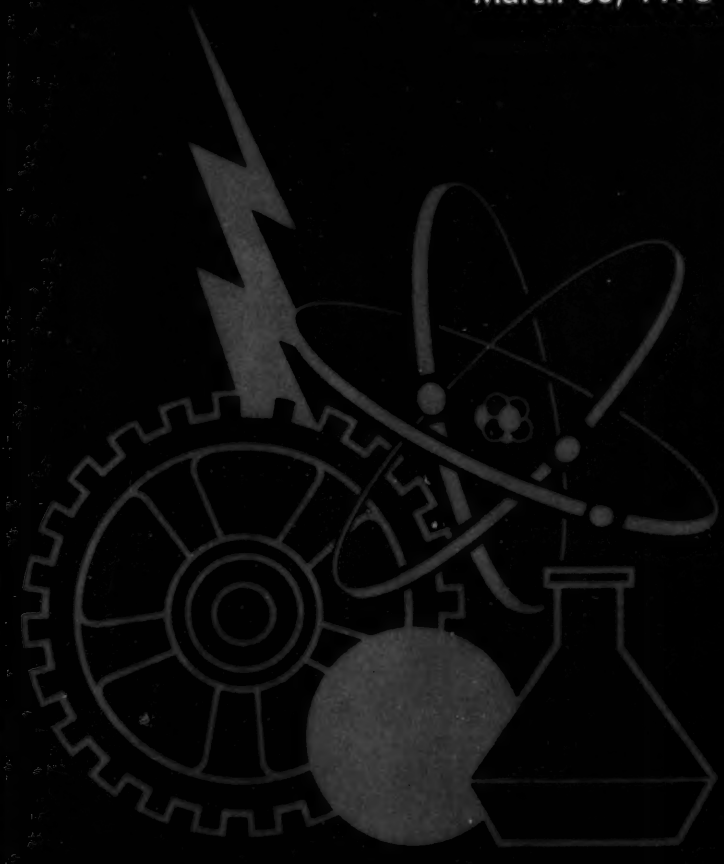
March 30, 1976



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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

March 30, 1976 Volume 944 Number 5

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

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Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Board of Appeals Decisions Rendered in the Month of February 1976

Examiner affirmed	196
Examiner affirmed in part	48
Examiner reversed	97
Total	341

Accessibility of Non-Final Discovery Opinions and Orders Issued by the Board of Patent Interferences

A number of inquiries have been received from the patent bar and other interested persons relating to discovery practice under 37 C.F.R. § 1.287 before the Board of Patent Interferences. The inquiries indicate a need for making available to the public non-final Board opinions, including concurring and dissenting opinions, as well as orders, made in the adjudication of discovery matters before the Board. While non-final opinions need not be made available to the public [5 U.S.C. § 552(a)(2)], in order to satisfy the need, copies of non-final opinions issued by the Board will be kept in a file in the Service Branch of the Board in the U.S. Patent and Trademark Office (Crystal Plaza, Building 6, Eleventh Floor, Room 1116, Arlington, Virginia). Opinions in the file may be reviewed by the public during normal business hours (8:30 A.M. to 5:00 P.M.). Copies of opinions may be made by the public on reproducing equipment in the Service Branch with tokens at a cost of $0.15 per page or copies may be ordered at a cost of $0.30 per page [37 C.F.R. 1.21(b)].

In view of the provisions of 35 U.S.C. § 122 and 37 C.F.R. § 1.11(a), a consent will be obtained by the Office from all parties in an interference before an opinion issued in connection with the interference is placed in the file if the interference file is not otherwise available to the public. Preliminary indications are that the parties and their counsel generally consent.

In order to obtain optimum dissemination of the information contained in the file, opinions placed therein will be indexed according to specific topics. Copies of the index will be updated from time to time as the need occurs. Specific questions relating to the index and file may be directed to the Patent Interference Examiners.

The initial index is as follows:

Index

1.00 Discovery in general [37 C.F.R. § 1.287]
- 1.10 Requests and service under § 1.287(a)
- 1.20 Requests under § 1.287(b)
- 1.30 Motions for additional discovery under § 1.287(c)
  - 1.31 Related to derivation
  - 1.32 Related to abandonment, suppression, and concealment
  - 1.33 Related to inequitable conduct
  - 1.34 Other
- 1.40 Motions under § 1.287(d)(1)
- 1.50 Action under § 1.287(d)(2)
- 1.60 Agreements under § 1.287(e)

C. MARSHALL DANN,
Mar. 5, 1976. *Commissioner of Patents and Trademarks.*

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,945,533, P. S. Fletcher, IMPROVED LEG REST AND ACTUATING MECHANISM; **3,002,416,** same, LEG-REST CONTROL LINKAGE FOR MULTIPLE POSITION CHAIR; **3,121,590,** F. F. Schliephacke, RECLINING CHAIR; **3,363,942,** P. S. Fletcher, RECLINING CHAIR SEQUENCING ARRANGEMENT; **Re. 24,849,** J. Luckhardt, ARTICLE OF REPOSE FOR SUPPORTING THE BODY OF A PERSON, filed Apr. 16, 1973, D.C., N.D. Ill. (Chicago), Doc. 73c973, *Peter S. Fletcher* v. *The Seng Co. et al.* Ordered that the complaint and all counterclaims are dismissed with prejudice, entered Aug. 20, 1975.

2,984,416, N. B. Johnson, HOT AIR HEATING METHODS, filed Jan. 30, 1973, D.C., W.D.N.Y. (Buffalo), Doc. 1973–50, *Johnson Heater Corporation* v. *Mosler Safe Company and Western New York Industrial Park, Inc.* Filed order dismissing the complaint on the merits and with prejudice against all defendants and all third party defendants and the third party complaints are dismissed on the merits and with prejudice, Dec. 3, 1975.

3,092,416. (See 2,945,533.)

3,121,590. (See 2,945,533.)

3,294,139, J. R. Preziosi, PLASTIC PATCH, SELF-LOCKING THREADED FASTENERS AND METHODS OF MAKING SUCH FASTENERS, filed June 18, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c1663, *Amerace Corporation* v. *USM Corporation.* Judgment, plaintiff's complaint and all claims are dismissed with prejudice. Defendant's counterclaims and all claims are dismissed with prejudice, entered Sept. 25, 1975.

3,363,942. (See 2,945,533.)

3,685,335, L. J. Kowal, TUBE BENDER, filed Dec. 11, 1975, D.C., N.D. Ohio (Toledo), Doc. C75–490, *Imperial-Eastman Corporation* v. *Robinair Manufacturing Corporation.*

3,766,851, Sirvet, Skrypek and Whelan, CONTINUOUS CAN PRINTER AND HANDLING APPARATUS, filed Dec. 3, 1974, D.C.N.J. (Newark), Doc. 74–1895, *Sun Chemical Corporation* v. *Van Vlaanderen Container Machinery, Inc.* Order terminating action Administratively, Dec. 12, 1975.

3,774,259, J. L. Genaro, AUTOMATIC SURFACE POLISHING SYSTEM, filed June 19, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c2013, *Shur Brite Wax-O-Matic, Inc.* v. *Garfield Park Auto Laundry, Inc.* Ordered that this cause is dismissed without prejudice, entered Dec. 10, 1975.

3,811,550, F. S. Ajero, APPARATUS FOR ORIENTING TAPERED ARTICLES, filed Dec. 9, 1975, D.C., E.D. Wis. (Milwaukee), Doc. 75–713, *Hughes Company, Inc.* v. *FMC Corporation.*

Re. 24,849. (See 2,945,533.)

Re. 25,595, Schwab, Beale and Anderson, PRINTED CIRCUIT BOARD FILE, filed Dec. 3, 1975, D.C., N.D. Ohio (Cleveland), Doc. C75–1049, *Bud Radio, Inc.* v. *Scanbe Manufacturing Corp.*

Re. 27,669, H. A. Rozanski, SWIMMING POOL COPING AND DECK CONSTRUCTION, filed Dec. 17, 1975, D.C., W.D.N.Y. (Buffalo), Doc. C–75–544, *Henry A. Rozanski* v. *H. C. Diffenderfer, doing business as Diffenderfer Pools.*

D. 236,758, P. R. Sollazzi, LUGGAGE; **D. 236,759,** same, LUGGAGE FLAP, filed Dec. 5, 1975, D.C.N.J. (Newark), Doc. 75–2083, *Rapid-American Corporation* v. *M & M Luggage Co., Inc.*

D. 236,759. (See D. 236,758.)

Second Trial Voluntary Protest Program

A Second Trial Voluntary Protest Program will be conducted during the coming months. It will be increased in scale and somewhat modified in procedure from the first such program. Announcement of and description of the rules for the first program appeared in 923 O.G. 2 on June 4, 1974.

As before, the objective is to gain experience in carrying out such a program and to determine the extent of interest by the public in participating and in supplying pertinent references. To the extent there is participation, the program should be beneficial by bringing new art to the attention of the Office, preventing inadvertent issuance of invalid

patents, and increasing confidence in the strength of those patents which survive the protest proceedings.

The first Trial Voluntary Protest Program showed a considerable interest by applicants and the public in taking part in protest proceedings. A summary of the results will be published soon in this Gazette. The second Trial Voluntary Protest Program is designed to gain additional information as to public participation and also to follow more closely the procedures which would be required in a continuing, permanent protest program.

Applications Involved

In the second Trial Voluntary Protest Program, a Request to Participate and Waiver of Confidentiality form (PTOL–224 Temp.) will be sent to each applicant to whom a Notice of Allowance is mailed during a selected three week period, probably in October, 1975. The total number of requests mailed will be about 4,500. Applications for plant patents will be excluded from the program. The reason for this exclusion is the high cost of printing colored drawings and the relatively limited prior art available. No other applications will be excluded from the trial program, regardless of subject matter, type of application or earlier proceedings.

Waiver of Confidentiality

Two copies of the form letter requesting voluntary waiver of confidentiality (form PTOL–224 Temp.) will be mailed in the same envelope along with the Notice of Allowance. An additional copy of the form letter will be made of record in each application at the time of mailing. The applicant will have three months from the notice of allowance date in which to either (1) elect to participate in the Trial Voluntary Protest Program by filing a signed waiver of confidentiality, or (2) elect not to participate in the program by paying the issue fee. If he does neither, the application will become abandoned, as provided in 37 C.F.R. 1.316. The waiver of confidentiality is a part of form PTOL–224 Temp. This procedure will avoid any increase in pendency time for those applications in which an election is made not to participate in the program. An early filing of a waiver of confidentiality by the applicant will result in early publication of the application.

Publication

If the applicant decides not to participate in the protest program and payment of the issue fee is timely made, the patent will issue routinely without delay.

If the applicant elects to participate in the protest program and a signed waiver of confidentiality is filed in the Office within 3 months of the notice of allowance date, the Notice of Allowance will be vacated. In such a case the issue fee should not be filed, as it will not be accepted and applied if filed with a signed waiver of confidentiality. An additional Notice of Allowance will be issued after the protest proceedings have been completed if only allowable claims remain in the application.

After a signed waiver has been filed, the application will be printed in the form of a patent and be available for sale as in the first Trial Voluntary Protest Program. At least one claim and a drawing figure, if any, will be printed in the OFFICIAL GAZETTE. These published applications will appear in about 6 to 9 issues of the OFFICIAL GAZETTE early in 1976. Advance notice will be given in the OFFICIAL GAZETTE of the dates on which applications will be published under this program.

Inspection of Files

The Patent and Trademark Office files of the published applications will be available for inspection by the public for a period of three months after publication. The application files will be retained in a single location in the Patent Issue Division during the protest period. This single location will be staffed with personnel to process papers directed to these files, supervise inspection of the files by the public, provide copies of file contents when ordered, and perform other related duties. A coin operated copying machine will also be available at this location.

Filing of Protests

Protests relating to the patentability of any published application must be filed in writing in the Patent and Trademark Office no later than three months after publication of the application. No extension of the three month protest period will be granted. Each protest must be filed in duplicate (one copy will be forwarded to the applicant and the other copy will be placed in the application file) and must indicate the grounds for protesting the allowance of any claim contained in the published application. If the protest involves prior art not of record in the application, two copies of the alleged prior art, together with an explanation of the relevance of such prior art to the allowed claims, should be included. The protester may also comment on the prior art record in the application and the manner in which it was applied.

In those applications where prima facie evidence of prior public use or sale the claimed invention is presented in accordance with 37 C.F.R. 1.292, public use proceedings will give the protester an opportunity to present evidence.

Should claims be copied from a published application for interference purposes, the applicant copying claims must also file a notice of such copying in the file of the published application to avoid the possibility of inadvertent issuance of the published application as a patent before conclusion of any interference proceedings.

For easy identification, all protests should be headed, "Protest Under Trial Voluntary Protest Program" and be addressed to:

Commissioner of Patents and Trademarks
Box TVPP
Washington, D.C. 20231

The protester should fully identify himself and include his mailing address so that communications may be addressed to him. In view of administrative problems encountered in the first Trial Voluntary Protest Program in protecting the confidentiality of the identity of protesters, no attempt will be made by the Office to maintain the confidentiality of any protester under the new program.

If no protests are received during the protest period, the application file will be rerouted for the mailing of a new Notice of Allowance. The file will not be returned to the examining group except for consideration of matters which normally require return of an allowed file.

If one or more protests are filed in an application, the application file and the protest(s) will be returned to the examining group for consideration.

Consideration of Protest

The examining group will acknowledge receipt of all protests. The authority for deciding whether or not the evidence submitted constitutes a prima facie showing of unpatentability of any allowed claim will reside with the Group Director. If the Group Director decides that no such showing has been made, the application will be forwarded to the Patent Issue Division for mailing of a new Notice of Allowance. Protesters will be notified in such cases that prosecution has not been reopened, and the applicant will be sent a duplicate copy of all protests. The decision of the Group Director will be final and will not be subject to petition by a protester.

If the Group Director decides that the submitted evidence constitutes a prima facie showing of unpatentability of any allowed claim, prosecution of the application will be reopened. The decision to reopen prosecution will be communicated to the applicant by means of an Office action, signed by a primary examiner, rejecting any claim considered unpatentable. The duplicate copy of each protest will be mailed to the applicant with the Office action. Protesters who submitted evidence on which the rejection is based will be identified in the Office action and will also receive copies of this and subsequent Office actions. Other protesters will be notified that prosecution has been reopened, but based on evidence and for reasons other than those submitted by them and that, consequently, no further correspondence will be directed to them. The applicant will normally be given a three month shortened statutory period to respond to the Office action.

Response by the Applicant to Subsequent Office Actions

During this period, the applicant may present amended or new claims which will be subject to further consideration by the primary examiner. In order to allow protesters who submitted evidence on which a rejection in the Office action

is based to participate in later prosecution and to comment upon further proceedings, applicant will be required to serve by mail upon each protester identified in the Office action, a copy of any response filed, including any appeal brief. Indication of such service will be a required component of a complete response. Applicant need only reply to the rejections and objections made in the Office action. There need be no specific response to any other points raised by the protesters.

Comment on Applicant's Response by the Protester

Each protester served will be allowed one month, running from the date applicant's response or brief is received in the Patent and Trademark Office, to file comments relating thereto. All communications from protesters must be in writing. Examiner interviews with the protesters will not be permitted. No extensions of the one month period will be granted.

Any appeal by the applicant to the Board of Appeals in a protested application will be made special and will be taken up out of order.

Conclusion of Prosecution

If, after further prosecution, the application is found to be allowable, all protesters still participating at that time will be notified and the application will be forwarded to the Patent Issue Division for mailing of a new Notice of Allowance. A decision of the primary examiner to allow an application will not be subject to petition or appeal by any protester.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Sept. 16, 1975.

[938 O.G. 945]

PATENT NOTICES

Certificate of Correction for the Week of Mar. 30, 1976

Re. 28,600	3,889,607	3,916,388	3,925,509
Re. 28,631	3,891,343	3,916,670	3,925,530
D. 231,089	3,893,540	3,917,040	3,925,695
D. 238,099	3,893,702	3,917,196	3,925,796
3,607,693	3,893,876	3,917,544	3,925,920
3,608,496	3,893,979	3,917,546	3,926,361
3,715,896	3,894,139	3,917,576	3,926,675
3,734,245	3,895,074	3,917,609	3,926,726
3,743,842	3,895,274	3,917,891	3,926,796
3,758,135	3,897,863	3,918,334	3,926,907
3,771,109	3,900,525	3,918,418	3,926,957
3,789,053	3,900,540	3,918,998	3,926,977
3,789,370	3,901,436	3,919,013	3,926,988
3,789,468	3,901,690	3,919,036	3,927,030
3,792,937	3,901,802	3,919,413	3,927,177
3,793,269	3,901,897	3,919,850	3,927,242
3,793,407	3,902,110	3,920,016	3,927,440
3,796,701	3,902,115	3,920,018	3,927,463
3,802,958	3,902,914	3,920,465	3,927,644
3,806,496	3,902,935	3,920,647	3,927,710
3,807,105	3,902,991	3,920,862	3,927,716
3,810,875	3,903,008	3,920,929	3,928,028
3,813,593	3,903,085	3,921,022	3,928,034
3,814,611	3,903,401	3,922,186	3,928,043
3,817,803	3,904,251	3,922,236	3,928,158
3,817,832	3,904,499	3,922,247	3,928,199
3,830,669	3,904,614	3,922,266	3,928,313
3,831,016	3,904,622	3,922,353	3,928,463
3,835,459	3,905,171	3,922,546	3,928,511
3,836,312	3,905,213	3,922,619	3,928,638
3,843,985	3,905,223	3,922,622	3,928,746
3,844,987	3,906,037	3,922,899	3,929,229
3,845,018	3,907,342	3,922,938	3,299,444
3,845,135	3,907,425	3,923,086	3,929,506
3,847,586	3,907,522	3,923,133	3,930,098
3,853,940	3,909,338	3,923,215	3,930,101
3,855,242	3,909,392	3,923,218	3,930,764
3,855,345	3,909,497	3,923,391	3,930,850
3,855,929	3,909,708	3,923,410	3,930,975
3,861,493	3,910,791	3,923,514	3,931,062
3,863,416	3,910,940	3,923,557	3,931,342
3,865,106	3,910,942	3,923,560	3,931,348
3,865,142	3,911,049	3,923,688	3,931,377
3,869,084	3,912,353	3,923,708	3,931,383
3,870,562	3,912,488	3,923,755	3,931,424
3,870,670	3,912,502	3,923,773	3,931,442
3,872,574	3,913,073	3,923,816	3,931,445
3,873,044	3,913,356	3,923,836	3,931,534
3,874,378	3,913,674	3,923,890	3,931,557
3,874,515	3,913,867	3,923,898	3,931,732
3,874,911	3,913,980	3,923,966	3,931,773
3,875,998	3,914,481	3,924,044	3,932,073
3,877,760	3,914,485	3,924,771	3,932,196
3,879,438	3,914,526	3,924,931	3,932,225
3,882,110	3,914,685	3,924,959	3,932,810
3,882,463	3,914,855	3,924,967	3,932,855
3,884,990	3,915,039	3,925,041	3,932,896
3,885,717	3,915,579	3,925,180	3,933,139
3,886,977	3,915,765	3,925,211	3,933,203
3,887,040	3,915,899	3,925,344	3,934,144
3,887,496	3,916,091	3,925,495	3,935,465

Disclaimers and Dedications

Reissue No. 28,327.—*John R. Lewis*, Framingham, Mass. FARADAY EFFECT SPEEDOMETER. Patent dated Feb. 4, 1975. Disclaimer and dedication filed Dec. 31, 1975, by the assignee, *Safe Flight Instrument Corporation*.

Hereby disclaims and dedicates to the Public the remaining term of said patent.

3,777,561.—*John R. Lewis*, Framingham, Mass. FARADAY EFFECT SPEEDOMETER. Patent dated Dec. 11, 1973. Disclaimer and dedication filed Dec. 31, 1975, by the assignee, *Safe Flight Instrument Corporation*.

Hereby disclaims and dedicates to the Public the remaining term of said patent.

Dedications

Design No. 198,157.—*Max Oswald Doss*, Woodside, N.Y. SOCCER SHOE. Patent dated May 12, 1964. Dedication filed Mar. 13, 1975, by the inventor.

Hereby dedicates to the Public the term of the patent subsequent to Dec. 31, 1974.

3,733,627.—*Harry Epstein*, Seaford, N.Y. ELECTRICIAN'S COMBINATION TOOL. Patent dated May 22, 1973. Dedication filed Feb. 12, 1976, by the assignee, *Kastar, Inc.*

Hereby dedicates said patent to the Public.

3,809,805.—*Vincent D. Kasprzak*, Auburn, Calif. VIDEO BANDWIDTH REDUCTION. Patent dated May 7, 1974. Dedication filed Feb. 19, 1976, by the assignee, *Arvin Industries, Inc.*

Hereby dedicates the remainder of the term of said patent.

Disclaimers

3,232,307.—*Ernest H. Bucknell* and *Irving A. Ward*, Los Angeles, Calif. TRANSFER VALVE. Patent dated Feb. 1, 1966. Disclaimer filed Feb. 23, 1976, by the assignee, *Pearl W. Bletcher*.

Hereby enters this disclaimer to all claims of said patent.

3,294,981.—*Amar G. Bose*, Chestnut Hill, Mass. SIGNAL TRANSLATION EMPLOYING TWO-STATE TECHNIQUES. Patent dated Dec. 27, 1966. Disclaimer filed Feb. 6, 1976, by the assignee, *Bose Corporation*.

Hereby enters this disclaimer to claims 5–9 and 30 of said patent.

3,733,548.—*Wallace H. Coulter*, Miami Spring, and *Walter R. Hogg*, Miami Lakes, Fla. APPARATUS AND METHOD FOR MEASURING PARTICLE CONCENTRATION OF A SUSPENSION PASSING THROUGH A SENSING ZONE. Patent dated May 15, 1973. Disclaimer filed Sept. 12, 1975, by the assignee, *Coulter Electronics, Inc.*

Hereby enters this disclaimer to claims 1, 5, 6, 10, 18, 19, 20, 25 and 26 of said patent.

3,755,454.—*Yun Ger Chang* and *Philip S. Bailey*, Austin, Tex. ORGANIC PEROXIDES AND METHOD THEREFOR. Patent dated Aug. 28, 1973. Disclaimer filed July 28, 1975, by the assignee, *Reichhold Chemicals, Inc.*

Hereby enters this disclaimer to claims 1, 2, 3, 4, 5 and 8 of said patent.

3,760,296.—*Karl Gerhard Hernqvist*, Princeton, N.J. INTERNALLY-MODULATED GAS LASER. Patent dated Sept. 18, 1973. Disclaimer filed Jan. 26, 1976, by the assignee, *RCA Corporation*.

Hereby enters this disclaimer to claims 1 and 2 of said patent.

3,779,292.—*Samuel A. Mencacci,* Saratoga, Calif. CARBONATED BEVERAGE FILLER. Patent dated Dec. 18, 1973. Disclaimer filed Jan. 19, 1976, by the assignee, *FMC Corporation.*

Hereby enters this disclaimer to claims 1, 2, 4–6, 9–12, 14, 15 and 18 of said patent.

3,875,011.—*Kenneth Edward Rubenstein,* Palo Alto, and *Edwin F. Ullman,* Atherton, Calif. ENZYME IMMUNOASSAYS WITH GLUCOSE-6-PHOSPHATE DEHYDROGENASE. Patent dated Apr. 1, 1975. Disclaimer filed Nov. 13, 1975, by the assignee, *Syva Company.*

The term of this patent subsequent to June 18, 1991, has been disclaimed.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for licensing in accordance with the licensing policies of the agency-sponsors.

Copies of the patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of the patent applications, either paper copy (PC) or microfiche (MF), can be purchased at the prices cited from the National Technical Information Service (NTIS), Springfield, Va. 22161. Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to the public to avoid premature disclosure in the event of an interference before the Patent and Trademark Office. Claims and other technical data will usually be made available to serious prospective licensees by the agency which filed the case.

Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

U.S. DEPARTMENT OF THE INTERIOR

Branch of Patents, 18th and C Sts. NW.
Washington, D.C. 20240

Patent application 496,591. Load Measuring Gage. Filed Aug. 12, 1974. PC $3.25/MF $2.25.

Patent application 522,829. Catalysts and Adsorbents Having High Surface Area to Weight Ratios. Filed Nov. 11, 1974. PC $3.25/MF $2.25.

Patent application 524,173. Removal of Trace Copper Ions From Water. Filed Nov. 15, 1974. PC $3.25/MF $2.25.

Patent application 538,227. Process for Recovery of Non-Ferrous Metals From Oxide Ores and Concentrates. Filed Jan. 2, 1975. PC $3.75/MF $2.25.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters, NASA—
Code GP–2, Washington, D.C. 20546

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U.S. DEPARTMENT OF THE ARMY

Office of Judge Advocate General, Patent Division,
Room 2C–455, Pentagon, Washington, D.C.

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U.S. DEPARTMENT OF COMMERCE

Assistant General Counsel for Administration
Washington, D.C. 20230

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U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

National Institutes of Health, Chief, Patent Branch,
Westwood Bldg, Bethesda, Md. 20014

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U.S. DEPARTMENT OF THE NAVY

Assistant Chief for Patents, Office of Naval Research,
Code 302, Arlington, Va. 22217

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters
NASA Code GP-2
Washington, D.C. 20546

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U.S. DEPARTMENT OF COMMERCE
Assistant General Counsel for Administration
Washington, D.C. 20230

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U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
National Institutes of Health, Chief, Patent Branch,
Westwood Bldg., Bethesda, Md. 20014

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters
NASA Code GP-2
Washington, D.C. 20546

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U.S. ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION
Assistant General Counsel for Patents
Washington, D.C. 20545

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U.S. DEPARTMENT OF AGRICULTURE
Research Agreements and Patent Mgmt. Branch,
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Hyattsville, Md. 20782

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ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION
Assistant General Counsel for Patents
Washington, D.C. 20545

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U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
National Institutes of Health, Chief, Patent Branch
Westwood Bldg, Bethesda, Md. 20014

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U.S. DEPARTMENT OF THE INTERIOR
Branch of Patents, 18th and C Sts., NW.
Washington, D.C. 20240

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters
NASA Code GP–2
Washington, D.C. 20546

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Patents Available for Licensing or Sale

3,593,818. METHOD AND APPARATUS FOR ENERGY DENSITY MEASUREMENTS IN STANDING ULTRASONIC WAVE FIELDS. Reimar Pohlmann, Germany. Correspondence to: Michael Striker, 360 Lexington Ave., New York, N.Y., 10017.

3,648,402. INSECT SWATTER. Reuben A. Siggers, Box 105, Institute, W. Va., 25112.

3,783,884. SECURE MONEY CHANGING AND MONEY RECEIVING SYSTEM. Edwin W. Carlberg, 7031 Woodhill Road, Dallas, Tex., 75217.

3,826,717. QUANTITATIVE ANTIBIOTIC TEST CONTAINER. Dr. Verne E. Gilbert, 301 Blount Professional Building, Knoxville, Tenn., 37920.

3,842,885. COMPOSITE BREAKER BELT FOR PNEUMATIC TIRES. Clarence F. Alban, 197 Breezeway, Brighton, Mich., 48116.

3,892,014. BUTTON-TYPE GRIPPING DEVICE—NO FUSS JUST INSERT. Josephine C. Nolan, 88—21 Francis Lewis Blvd., Queens Village, N.Y., 11427.

3,911,752. REMOTE CONTROL APPARATUS FOR TELEVISION RECEIVERS. Joyce L. Olson, Arlington, Va., and Stephen A. Lazorcak, Jr., Arlington, Va. Correspondence to: Stephen A. Lazorcak, P.O. Box 33082, District Heights, Md., 20028.

3,915,323. VERSATILE BOAT LOADING APPARATUS USED ON RECREATIONAL VEHICLES. Oscar E. Underhill, 1009 Barrow St., Anchorage, Alaska, 99501.

3,916,459. TOILET BOWL VETILATING APPARATUS IN KIT FORM. Marko Ivancevic, 423 N. Broadway, Redondo Beach, Calif., 90277.

3,917,275. GAME SUPPORT TRAY. Elliott J. Alpher, Washington, D.C. Correspondence to: Frederick L. Bergert, 1755 Jefferson Davis Highway, Suite 507, Arlington, Va., 22202.

3,920,240. INCLINED PORTABLE EXERCISE FRAME. Cecil J. Ross, 8600 Grover Drive, El Paso, Tex., 79925.

3,921,325. COMBINATION HIGHWAY FLARE AND PORTABLE FLARE GUN. Kalenen T. Tennigkeit, 5204 Oro Bangos Highway, Oroville, Calif., 95965.

3,930,797. AIR TREATMENT DEVICE. Albert E. Gertz, 9232 Alcona St., Lanham, Md., 20801.

3,933,286. PIN CUSHION AND METHOD OF MAKING SAME. Esko K. Karkas, 22 Howland Road, Toronto, Ontario, Canada, M4K 2Z6.

3,934,559. ANTI-POLLUTANT SPHERICAL ROTARY ENGINE WITH AUTOMATIC SUPERCHARGE. William A. Cohen, Brooklyn, N.Y., assignor to Sphero International Co., West Long Branch, N.J. Correspondence to: William A. Cohen, 1005 E. 17th St., Brooklyn, N.Y., 11230.

3,937,359. VARIABLE VENT COVER FOR COOKING VESSELS. Archibald Dicks Stockton, Jr., 3868 S. Lake Drive, Roanoke, Va., 24018.

Eastman Kodak Company announces that, in accordance with its policy, non-exclusive licenses upon reasonable terms are available under the following patent:

3,487,762. IRIS TYPE DIAPHRAGM.

Hazeltine Research, Inc., offers to grant non-exclusive licenses on reasonable terms and conditions under the following patent.

Inquires and request for licenses should be addressed to: Hazeltine Research, Inc., 5445 W. Diversey Ave., Chicago, Ill., 60639, Attention: Mr. S. P. Ronzheimer, president.

3,316,349. IMAGE ORTHICON BEAM CONTROL SYSTEM FOR AUTOMATICALLY OPTIMIZING SIGNAL TO NOISE RATIO OF THE VIDEO OUTPUT.

General Electric Company is prepared to grant non-exclusive licenses under the following 23 patents on reasonable terms to domestic manufacturers.

Applications for licenses under the following 10 patents may be addressed to: Mrs. A. B. Lane, General Electric Co., Building 43, Room 529, 100 Woodlawn Ave., Pittsfield, Mass., 01201.

3,301,938. LIGHT WEIGHT FLEXIBLE HIGH VOLTAGE BUSHING.

3,328,515. POLYMERIC INSULATOR WITH MEANS FOR PREVENTING BURNING DUE TO LEAKAGE CURRENT AND ARCS.

3,310,643. TWO POSITION SNAP ACTION POSITIVE INDICATION SWITCH.

3,509,608. TAB WELDED JOINT AND METHOD OF MAKING THE SAME.

3,566,183. LIGHTNING ARRESTER COOLING APPARATUS.

3,705,826. INSULATING COATING AND METHOD OF MAKING THE SAME.

3,715,696. DISC WINDING WITH INTEGRAL LOAD CURRENT CARRYING RIB SHIELDING.

3,720,549. INSULATING COATING AND METHOD OF MAKING THE SAME.

3,720,867. FAIL SAFE VACUUM TYPE CIRCUIT INTERRUPTER AND ASSOCIATED LOAD CURRENT TAP CHANGER FOR ELECTRIC INDUCTION APPARATUS.

3,789,774. TRANSPORT VEHICLE FOR LONG LOADS HAVING LIMITED LATERAL ROADWAY CLEARANCE.

Application for license may be addressed to the Group Patent Counsel, Major Appliance Business Group, General Electric Company, Appliance Park, Louisville, Ky., 40225.

3,636,645. APPLIANCE CONTROL CONSOLE.

3,721,015. BEARING ASSEMBLY.

3,912,085. HOUSEHOLD REFRIGERATOR SHELF.

3,913,350. ICE MAKER INCLUDING IMPROVED RAKE ASSEMBLY.

3,915,349. LAUNDRY ADDITIVE DISPENSER.

3,915,596. CONDENSER APPARATUS.

3,919,726. WATER CLOSET HAVING A BOWL AND A WASH MEANS.

3,921,252. HINGE ASSEMBLY FOR A DISHWASHER DOOR.

3,921,515. COMPACTOR.

3,922,798. CLOTHES DRYER.

3,923,357. ALTERNATIVELY-MOUNTED COMPACTOR DOOR ARRANGEMENT.

3,924,085. SAFETY-START DEVICE AND CIRCUIT CONTROLLER FOR DOMESTIC APPLIANCE.

3,926,486. MODULAR FURNISHINGS.

Applications for licenses under the following 132 patents may be addressed to: Arnold E. Renner, Patent Counsel, General Electric Company, 1501 Roanoke Blvd., Salem, Va., 24153.

2,876,355. WAVEFORM COMPENSATION NETWORKS.

2,879,482. SEMICONDUCTOR MIXING CIRCUITS.

2,892,974. MAGNETIC AMPLIFIER SENSING AND MOTOR CONTROL COMBINATIONS.

2,893,635. QUALITY CONTROL SEQUENTIAL ANALYZER.

2,899,616. ADJUSTABLE VOLTAGE CONTROL SYSTEM.

2,913,541. SEMICONDUCTOR WAVE FILTER.

2,930,996. ACTIVE ELEMENT IMPEDANCE NETWORK.

2,937,289. DIGITAL TO ANALOG CONVERTER.

2,938,669. QUALITY CONTROL DEVICE.

2,947,876. PINHOLE DETECTING UNIT.

2,958,814. CONTROL SYSTEM FOR ALTERNATING CURRENT MOTOR.

3,186,200. AUTOMATIC THICKNESS REGULATOR FOR STRIP ROLLING MILLS.

3,187,203. WAVE GENERATING CIRCUIT.

3,193,696. VOLTAGE REGULATION EMPLOYING A TIME BASE MODULATED AMPLIFIER.

3,209,226. CONTROL SYSTEM FOR ALTERNATING CURRENT MOTOR.

3,209,245. INDUCTIVE METAL DETECTION DEVICE.

3,209,845. AUTOMATIC WEIGHER.

3,213,351. FIRING PULSE GENERATING CIRCUIT FOR SOLID STATE CONTROLLED RECTIFIERS.

3,214,604. TUNNEL DIODE-SATURABLE REACTOR CONTROL CIRCUIT.

3,226,551. CURRENT SHAPING CIRCUIT FOR PHOTOSENSITIVE DEVICE.

3,226,555. PHOTOSENSITIVE SYSTEM FOR INDICATING VARIATIONS IN A DIMENSION OF AN ARTICLE.

3,237,074. VOLTAGE REGULATION FOR DIRECT CURRENT MOTORS.

3,238,839. OPTICAL THICKNESS GAUGE.

3,243,602. SILICON CONTROLLED GATE TURN OFF SWITCH CIRCUIT WITH LOAD CONNECTED TO INTERIOR JUNCTION.

3,255,403. VOLTAGE REGULATING SYSTEM.

3,266,279. AUTOMATIC GAUGE CONTROL SYSTEM FOR ROLLING MILLS.

3,266,376. HYDRAULIC REGULATING VALVE.

3,267,228. RATE OF ANGULAR ACCELERATION DEVICE.

3,273,046. INVERTER CIRCUITS WITH INDEPENDENT COMMUTATION CIRCUITS.

3,281,592. JOURNAL BOX DETECTION APPARATUS.

3,284,647. SIGNAL PRODUCING CIRCUIT.

3,284,688. D.-C. CURRENT REGULATOR INCLUDING A HIGH GAIN SATURATING AMPLIFIER.

3,290,509. ELECTRO-OPTICAL APPARATUS AND CIRCUIT FOR SENSING REFLECTIVE AREAS OR APERTURES IN TAPE.

3,295,054. SWITCHING CIRCUIT.

3,296,521. POSITION REGULATING DEVICE.

3,299,771. SHUTTER FOR PINHOLE DETECTORS.

3,303,340. OPTICAL ARRANGEMENT IN HOT BOX DETECTION APPARATUS.

3,317,793. CIRCUITS FOR PROTECTING ELECTRICAL POWER SOURCES.

3,337,721. COUNT BY SIX COUNTER.

3,340,407. DEENERGIZING CIRCUIT.

3,343,063. VARIABLE FREQUENCY CONVERTER WITH VOLTS PER CYCLE PER SECOND REGULATION.

3,346,744. POWER CONTROL CIRCUITS.

3,346,798. REGULATOR FOR INVERTER.

3,348,201. SIGNAL DETECTION CIRCUIT.

3,360,713. POWER CONTROL CIRCUITS USING BI-DIRECTIONAL CONTROLLABLE SEMICONDUCTOR SWITCHING DEVICES.

3,368,129. MOTOR CONTROL CIRCUIT EMPLOYING BRAKE MEANS FOR PROTECTION AGAINST UNBALANCE OF SOURCE CURRENT.

3,397,321. POWER CONTROL APPARATUS.

3,406,347. CIRCUIT FOR MODIFYING AN ELECTRICAL SIGNAL.

3,424,908. AMPLIFIER FOR PHOTOCELL.

3,437,833. SIGNAL PULSE SHAPER.

3,440,568. GENERATOR FOR AMPLITUDE AND FREQUENCY MODULATED LOW-FREQUENCY ALTERNATING VOLTAGES.

3,441,739. WIDTH GAGE WHICH GENERATES PULSE WIDTH PROPORTIONAL TO DEVIATION FROM DESIRED WIDTH.

3,447,367. LOAD CELL WITH REMOVABLE, LOW HYSTERESIS LOAD SENSORS.

3,470,467. PIN INTERCONNECTION VERIFICATION SYSTEM RESPONDING TO A REPEATED OCCURRENCE OF A PREDETERMINED VOLTAGE ON ONE OF THE PINS.

3,474,251. PHOTOCELL AMPLIFIER.

3,480,797. CONTROLLED SILICON RECTIFIER CIRCUIT HAVING HIGH NON-CONDUCTING NEGATIVE BIAS RATIO.

3,484,686. TACHOMETER FOR A D.C. MOTOR UTILIZING AN AUXILIARY PAIR OF BRUSHES.

3,487,400. SYSTEM FOR EXTENDED RESOLUTION OF A BINARY CODED PATTERN DEVICE.

3,492,562. TRIGGER CIRCUIT FOR PROVIDING TANDEM OPERATION OF SWITCHING REGULATORS.

3,503,033. COIL SPRING CONNECTOR.

3,518,736. ROLLING MILL DESCALING DEVICE.

3,519,828. AUTOMATIC GAIN CONTROL CIRCUIT FOR PHOTOCELL AMPLIFIERS USING VARIATION OF FORWARD BIAS ACROSS PHOTOCELL.

3,522,452. HYSTERETIC GATING CIRCUIT FOR SILICON CONTROLLED RECTIFIER.

3,527,996. SWITCHING VOLTAGE REGULATOR USING TIME RATIO CONTROL WITH FORCED COMMUTATION.

3,529,224. SPEED CONTROL OF INDUCTION MOTORS WITH SEMICONDUCTORS AND RESISTORS.

3,532,887. MEASURING BY MEANS OF THE INFRARED EMISSION THEREFROM THE LENGTH OF A MOVING HOT METAL SLAB.

3,539,901. RECTIFIER FREQUENCY CONVERTER.

3,541,423. MARGIN ANGLE DETECTOR.

3,545,087. DIGITAL CONTROL CALIBRATION SYSTEM FOR STRIP LENGTH GAUGE.

3,554,646. OPTICAL DISTANCE GAUGE.

3,560,835. MEANS FOR PROTECTING ELECTRIC POWER CONVERTERS FROM COMMUTATION FAILURE.

3,560,836. MEANS FOR PROTECTING ELECTRIC POWER CONVERTERS FROM COMMUTATION FAILURE.

3,561,743. USE OF STACK GAS AS OXYGEN POTENTIAL MEASUREMENTS TO CONTROL THE BOF PROCESS.

3,564,273. PULSE WIDTH MODULATED CONTROL SYSTEM WITH EXTERNAL FEEDBACK AND MECHANICAL MEMORY.

3,569,687. PULSE RATE TO ANALOG CONVERTER PRODUCING AN ANALOG OUTPUT SIGNAL PROPORTIONAL TO THE PRODUCT OF TWO INPUT PULSE RATES.

3,581,536. APPARATUS FOR SENSING THE UNSTRESSED SHAPE OF A THIN STRIP SUBJECTED TO HIGH TENSILE STRESS.

3,593,103. INVERTER SYSTEM WITH AUTOMATIC RIDETHROUGH.

3,594,744. RECORDER CONTROL DEVICE FOR HOTBOX DETECTOR SYSTEM.

3,604,804. NONCONTACTING MOTION SENSOR.

3,622,859. RECTIFIER FREQUENCY CONVERTERS.

3,646,343. METHOD AND APPARATUS FOR MONITORING HOT BOXES.

3,654,541. THYRISTOR STATE SENSOR.

3,671,824. SPEED CONTROL SYSTEM FOR A ROTATING ELEMENT OF CHANGING DIAMETER.

3,683,653. MOTOR DRIVE SYSTEM FOR ROLLING MILL.

3,693,427. SHAPE CONTROL SENSOR FOR COLD ROLLING MILLS.

3,721,820. COMPUTING CAR LOCATIONS IN A TRAIN.

3,762,194. CONSTANT SPEED DRIVEN CONTINUOUS ROLLING MILL.

3,763,678. APPARATUS FOR AUTOMATIC CONTROL OF PRODUCT FILL DIMENSION.

3,801,898. DC BUS RESISTIVE PATH TO GROUND FAULT DETECTOR.

3,806,906. CELL SURVEILLANCE MONITOR FOR A POWER CONVERTER.

3,811,078. DC MOTOR DRIVE SYSTEM FOR WINDING REEL.

3,811,304. LOOPER CONTROLLED ROLLING MILL.

3,826,957. DOUBLE-SIDED HEAT-PIPE COOLED POWER SEMICONDUCTOR DEVICE ASSEMBLY USING COMPRESSION RODS.

Re. 25,671. SERVO-CONTROLLED SHUTTERS FOR PINHOLE DETECTORS.

2,976,434. TRANSDUCER ASSEMBLY.

2,979,984. SHUTTER FOR PINHOLE DETECTORS.

2,982,128. DYNAOMETER CONTROL SYSTEM.

2,982,897. DUAL-MOTOR A.C. DRIVE FOR AUTOMATIC HOISTS.

2,982,901. REPOSITIONING SELECTIVE CONTROL SYSTEM.

2,991,996. ARTICLE DISPENSING APPARATUS.

2,997,654. BINARY COUNTER.

3,011,105. COOLED RECTIFIER ASSEMBLY.

3,018,383. ELECTRICAL MASTER SLAVE AMPLIFIER CIRCUIT EMPLOYING SILICON CONTROLLED RECTIFIERS.

3,026,485. UNIJUNCTION RELAXATION OSCILLATOR WITH TRANSISTOR IN DISCHARGE CIRCUIT OF CHARGE CAPACITOR, FOR COUPLING DISCHARGE TO OUTPUT CIRCUIT.

3,033,991. NON-CONTACTING CROP SHEAR DETECTOR.

3,040,270. SILICON CONTROLLED RECTIFIER CIRCUIT INCLUDING A VARIABLE FREQUENCY OSCILLATOR.

3,070,227. CONVEYOR CONTROL SYSTEM.

3,071,697. PULSE GENERATOR UTILIZING TRANSISTOR WITH SATURABLE CORE FEEDBACK AND ADJUSTABLE BIAS TO VARY LOAD CURRENT.

3,079,541. CURRENT REGULATOR.

3,090,115. METHOD OF INSTALLING GROMMETS.

3,092,732. MAXIMUM SIGNAL IDENTIFYING CIRCUIT.

3,092,764. PHOTOELECTRICAL TENSION SENSING MOTOR CONTROL CIRCUIT.

3,095,510. SWITCHING CIRCUIT FOR VOLTAGE MAGNITUDE GREATER THAN THE RATED VOLTAGE OF ONE TRANSISTOR.

3,098,965. CLOSED LOOP CONTROL DEVICE.

3,106,643. RADIATION INVERSION DEVICE AND FLAW DETECTOR EMBODYING SAME.

3,119,980. FALSE ERROR PREVENTION CIRCUIT.

3,124,699. APPARATUS FOR CONTROLLING THE INTERCHANGE OF POWER BETWEEN A PLURALITY OF POWER SYSTEMS.

3,132,293. PLURAL MOTOR DRIVE FOR ROLLING MILL WINDING REEL.

3,132,294. MOTOR COMMUTATOR UTILIZING CONTROLLER RECTIFIERS.

3,139,539. CONTROL CIRCUIT PRODUCING OUTPUT SIGNAL SO LONG AS INPUT PULSES OCCUR WITHIN CERTAIN TIME INTERVAL.

3,139,579. SELF-BALANCING SIMULATED BRIDGE CIRCUIT FOR MEASURING IMPEDANCE.

3,148,336. CURRENT AMPLIFIER PROVIDING SUM OF ABSOLUTE VALUES OF SIGNALS.

3,152,306. CONTROL CIRCUIT FOR ASTABLE MULTIVIBRATOR.

3,156,361. SHEET CLASSIFYING SYSTEM.

3,157,836. SATURABLE REACTOR BIASING CIRCUIT.

3,158,799. FIRING CIRCUIT FOR CONTROLLER RECTIFIERS.

3,162,775. SCANNING DEVICE EMPLOYING CRYOTRON BRIDGES CONNECTED IN FREE-MATRIX FOR MEASURING MAGNITUDES OF SELECTED INPUT SIGNALS.

3,167,657. ELECTRO-OPTICAL COUNTER CIRCUIT.

3,169,735. HOTBOX DETECTOR.

3,176,212. DIRECT CURRENT POWER SUPPLIES.

3,179,869. FEEDBACK FAILURE PROTECTION FOR MOTOR IN CRANE CONTROL SYSTEM.

3,184,938. METHODS AND APPARATUS FOR AUTOMATICALLY THREADING STRIP ROLLING MILLS.

The RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the patents listed below. Inquiries respecting licenses under RCA Corp. Staff Vice President, Domestic Licensing, 30 Rockefeller Plaza, New York, N.Y., 10036.

Re. 28,702. NONINTERACTING LENS SYSTEM FOR A COLOR ENCODING CAMERA.

3,930,606. METHOD AND APPARATUS FOR SECURING WIRES TO CONNECTOR TERMINALS.

3,930,653. LID LATCH MECHANISM FOR A DISC RECORD PLAYER.

3,930,908. ACCURATE CONTROL DURING VAPOR PHASE EPITAXY.

3,931,463. SCENE BRIGHTNESS COMPENSATION SYSTEM WITH CHARGE TRANSFER IMAGER.

3,931,465. BLOOMING CONTROL FOR CHARGE COUPLED IMAGER.

3,931,514. OPTICAL SWITCHING SYSTEM.

3,931,547. PROTECTION CIRCUIT.

3,931,588. VOLTAGE CONTROLLED OSCILLATOR UTILIZING FIELD EFFECT TRANSISTORS.

3,931,621. VARIABLE AMPLITUDE TIMED ALARM SYSTEM.

3,931,634. JUNCTION-ISOLATED MONOLITHIC INTEGRATED CIRCUIT DEVICE WITH MEANS FOR PREVENTING PARASITIC TRANSISTOR ACTION.

3,931,736. IMPROVED FLUID FLOW SENSOR CONFIGURATION.

3,932,011. CONDITIONING PARTIALLY COMPLETED CRT BULB ASSEMBLY FOR STORAGE AND/OR TRANSIT.

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3,932,226. METHOD OF ELECTRICALLY INTERCONNECTING SEMICONDUCTOR ELEMENTS.

3,932,299. METHOD FOR THE REDUCTION OF IRON IN IRON-DOPED LITHIUM NIOBATE CRYSTALS.

3,932,775. INTERLACED READOUT OF CHARGE STORED IN A CHARGE COUPLED IMAGE SENSING ARRAY.

3,932,786. ELECTRON GUN WITH A MULTI-ELEMENT ELECTRON LENS.

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3,932,873. SHORTENED APERTURE DIPOLE ANTENNA.

3,932,874. BROADBAND TURNSTILE ANTENNA.

3,932,876. SHORT END-FIRE CIRCULARLY POLARIZED ANTENNA.

3,933,504. PHOTOCHROMIC LITHIUM NIOBATE AND METHOD FOR PREPARING SAME.

3,933,530. METHOD OF RADIATION HARDENING AND GETTERING SEMICONDUCTOR DEVICES.

3,934,059. METHOD OF VAPOR DEPOSITION.

3,934,180. METHOD OF REPRODUCING AN ELECTROSTATIC CHARGE PATTERN IN INTENSIFIED FORM.

3,934,199. METHOD OF TESTING AN ELECTRICAL CIRCUIT.

3,934,263. VIDEO DISC RECORDING APPARATUS AND METHODS.

3,934,544. ULTRASONIC WAVE TRANSMITTER MECHANISM.

3,934,902. CONNECTOR FOR A CORRUGATED CONDUIT.

3,935,331. PREPARATION OF OLEFIN SO_2 COPOLYMER ELECTRON BEAM RESIST FILMS AND USE OF SAME FOR RECORDING.

3,935,332. DEVELOPMENT OF POLY(1-METHYL-1-CYCLOPENTENE-SO_2) ELECTRON BEAM RESIST.

3,935,573. DOPPLER RADAR SENSOR CALIBRATOR.

3,935,591. AUDIO-VISUAL APPARATUS WITH CONTROL SIGNAL OPERATED GATING MEANS.

3,923,188. SATELLITE PROPELLANT MANAGEMENT SYSTEM.

3,923,189. QUARTZ TO GLASS SEAL.

3,923,566. METHOD OF FABRICATING AN APERTURED MASK FOR A CATHODE-RAY TUBE.

3,923,685. LIQUID CRYSTAL COMPOSITIONS.

3,924,020. METHOD OF MAKING AN OPTICAL WAVEGUIDE.

3,924,159. AMPLIFIER PROTECTION SYSTEM.

3,924,192. MULTIBAND RANDOM CHANNEL ADDRESS CRYSTAL-LOCK TUNING SYSTEM.

3,924,202. ELECTRONIC OSCILLATOR.

3,924,266. AUTOMATIC LUMINANCE CHANNEL BANDWIDTH CONTROL APPARATUS RESPONSIVE TO THE AMPLITUDE OF COLOR IMAGE INFORMATION.

3,924,323. METHOD OF MAKING A MULTIPLICITY OF MULTIPLE-DEVICE SEMICONDUCTOR CHIPS AND ARTICLE SO PRODUCED.

3,924,361. METHOD OF SHAPING SEMICONDUCTOR WORKPIECES.

3,924,925. FOCUSSED IMAGE HOLOGRAM PROJECTOR USING A LONG NARROW LIGHT SOURCE.

3,924,974. FLUID EJECTION OR CONTROL DEVICE.

3,925,236. ELECTRO-OPTIC COMPOSITIONS AND DEVICE.

3,925,237. NOVEL LIQUID CRYSTAL ELECTRO-OPTIC DEVICES.

3,925,238. NOVEL LIQUID CRYSTAL ELECTRO-OPTIC DEVICES.

3,925,657. INTRODUCTION OF BIAS CHARGE INTO A CHARGE COUPLED IMAGE SENSOR.

3,925,688. INTEGRAL CYCLE ZERO-VOLTAGE SWITCHING CIRCUITS.

3,925,718. CURRENT MIRROR AND DEGENERATIVE AMPLIFIER.

3,925,790. IMAGE GENERATOR HAVING A PLURALITY OF MARKER UNITS OPERATED IN A PREDETERMINED SEQUENCE TO INHIBIT THE FORMATION OF PATTERNS.

3,926,637. PERMANENT ORGANIC VOLUME PHASE HOLOGRAPHIC RECORDING MEDIUM.

3,926,693. METHOD OF MAKING A DOUBLE DIFFUSED TRAPATT DIODE.

3,927,251. METHOD AND APPARATUS FOR THE DETECTION AND CONTROL OF ERRORS IN TWO-DIMENSIONALLY COMPRESSED IMAGE DATA.

3,927,255. BLACK LEVEL CLAMPING CIRCUIT FOR A TELEVISION SIGNAL PROCESSOR.

3,927,332. DRIVE CIRCUIT FOR CONTROLLING CONDUCTION OF A SEMICONDUCTOR DEVICE.

3,927,341. CATHODE RAY TUBE GUN HAVING NESTED ELECTRODE ASSEMBLY.

3,927,376. SPEAKER MUTING SYSTEM.

3,927,383. LOW NOISE WIDE BAND TRANSDUCER SYSTEM.

3,928,808. ANALOG VOLTAGE GENERATORS FOR TELEVISION TUNERS.

3,928,845. CHARACTER GENERATOR SYSTEM SELECTIVELY PROVIDING DIFFERENT DOT-MATRIX SIZE SYMBOLS.

3,929,426. METHOD OF ANCHORING METALLIC COATED LEADS TO CERAMIC BODIES AND LEAD-CERAMIC BODIES FORMED THEREBY.

3,929,525. METHOD OF FORMING OHMIC CONTACTS.

3,929,532. METHOD FOR ETCHING APERTURED WORK PIECE.

3,930,117. VIDEO CAPACITIVE DISC PLAYBACK APPARATUS AND STYLUS WITH DIELECTRIC COATING THEREFOR.

3,930,185. DISPLAY SYSTEM WITH SIMPLIFIED CONVERGENCE.

3,930,206. BROAD-BAND AMPLIFIER USING CASCADED CLASS C AMPLIFIERS.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF FEBRUARY 28, 1976

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	6-30-75
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-3-75
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	1-13-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	2-28-75
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	4-16-75
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination: Horology; Acoustics; Recorders; Weighing Scales.	1-2-75
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	3-17-75
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	5-5-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	8-29-75
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	5-5-75
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	12-12-74
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	4-1-75
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	6-3-75
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	6-4-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	3-28-75
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	8-5-75

Expiration of patents: The patents within the range of numbers indicated below expire during March 1976, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,875,445 to 2,880,418 inclusive
Plant Patents..... Numbers 1,914 to 1,924 inclusive

PATENT APPLICATIONS

PUBLISHED MARCH 30, 1976
UNDER THE SECOND TRIAL VOLUNTARY PROTEST PROGRAM

NOTE- A copy of the notice setting forth the details of the Second Trial Voluntary Protest Program may be found in the Patent and Trademark Notices section of this issue.

Any protests relating to the patentability of these published applications must be filed in writing before June 30, 1976. These applications are available for inspection in the Allowed Files Branch, Crystal Plaza, Room 2-10C28. All correspondence should be addressed to:

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Washington, D.C. 20231

Printed copies of the published applications may be purchased from the Patent and Trademark Office at 50 cents each.

An "Index of Applicants and Assignees of Published Applications" and a concordance entitled "Classification of Published Patent Applications" are located in the back of this issue.

GENERAL AND MECHANICAL APPLICATIONS

B 337,023

INDUCTION SEALED CLOSURE

George C. Ray, Battle Creek, Mich., assignor to General Foods Corporation, White Plains, N.Y.

Filed Mar. 1, 1973, Ser. No. 337,023

Int. Cl.[2] B65D *53/04, 53/06*

U.S. Cl. 215—347 **9 Claims**

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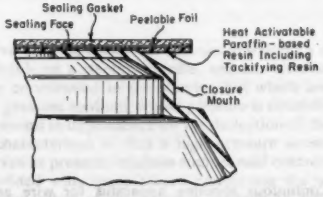

1. In an improved hermetically sealed package, an hermetic closure in combination comprising a closure mouth having a closure face, said face having a synthetic organic thermoplastic of a first melting point, and an abutting sealing membrane sealed to said closure face consisting essentially of an electrically conductive foil ply less than 5 mils thick having a frangible paraffin-based wax ply coated thereon, said wax ply having a melting point less than the first melting point and having been heated to above its own melting point but less than said first melting point while in abutting face-to-face pressure contact with said closure face and forming a continuous caulking seal with said face, said wax ply having been caused to flow in the region of abutment and being deformed to caulk the sealing face of the closure, said wax ply having a tackifying agent present in a minor weight percent thereof, the tensile strength of the wax ply being less than 60 psi and less than that of said synthetic organic thermoplastic material of said face whereby the ply is operative to fail in a cleavage pattern in the coating per se.

B 363,565

DEVICE FOR THE RAPID DISENGAGEMENT OF A RETAINING SYSTEM IN VEHICLES

Werner Breitschwerdt, and Heinz W. Knoll, both of Stuttgart, Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany

Filed May 24, 1973, Ser. No. 363,565

Claims priority, application Germany, May 31, 1972, 2226389

Int. Cl.[2] B60R *21/10*

U.S. Cl. 280—150 SB **12 Claims**

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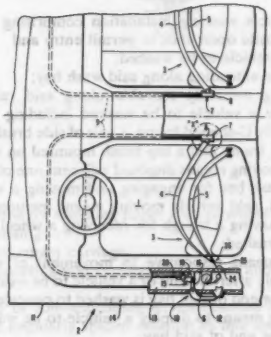

1. An installation for the rapid release of a retaining system in vehicles with a vehicle body characterized in that at least one actuating means is provided at a readily accessible place of the vehicle body which includes means enabling the initiation of a release of the retaining system from the outside of the vehicle body, and in that the actuating means cooperates with an outside door handle means which is operatively connected with a belt release means and which, upon exceeding a predetermined actuating force acting on the same, initiates an unlatching of the belt release means.

B 419,364
VEHICLE WASHING INSTALLATION

Richard W. Fullerton, 7603 Morningstar Ave., Harrisburg, Pa. 17112

Filed Nov. 27, 1973, Ser. No. 419,364
Int. Cl.² B60S 3/06
U.S. Cl. 15—53 A 1 Claim

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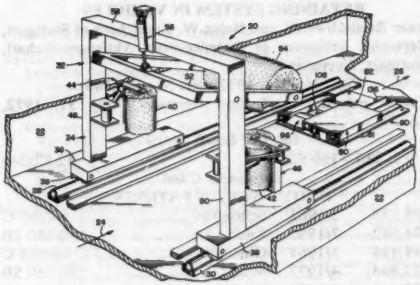


1. A vehicle washing installation comprising a wash bay having opposite open ends to permit entry and exit of a vehicle to be washed;

rail means extending along said wash bay;

a washing assembly movable along said rail means to traverse a vehicle to be washed including an inverted, generally U-shaped frame, a pair of side brushes mounted on said frame and a top brush mounted on said frame;

vehicle moving means disposed adjacent one of said ends of said wash bay for engaging and moving a vehicle to be washed, said vehicle moving means includes a movable truck having a trough for receiving a wheel of a vehicle to be washed;

control means responsive to movement of said washing assembly after the end of a vehicle to be washed adjacent said one end of said bay is washed to operate said vehicle moving means to display a vehicle to be washed toward said one end of said bay;

wherein said control means includes stop switch means actuated in response to movement of said vehicle moving means a predetermined distance from a rest position to an extended position to stop movement of said vehicle moving means at said extended position and to restart movement of said washing assembly along the bay;

wherein said washing assembly is movable along the bay in a first direction to wash the vehicle and in a second direction opposite to said first direction to rinse the vehicle, and

start switch means is responsive to movement of said washing assembly in said second direction to initiate movement of said vehicle moving means from said extended position to said rest position.

B 420,321
CONTINUOUS SPOOLING APPARATUS

Edward Charles Vidler, 33 Broom Hill Road, Strood, Rochester, Kent, England

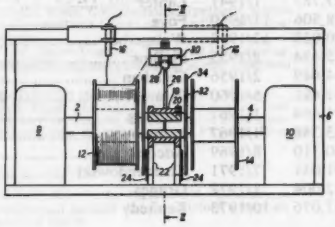
Filed Nov. 29, 1973, Ser. No. 420,321
Claims priority, application United Kingdom, Dec. 1, 1972, 55508/72
Int. Cl.² B65H 67/04
U.S. Cl. 242—25 A 4 Claims

References Cited
UNITED STATES PATENTS

2,932,462	4/1960	Nelson	242/25 A
3,323,735	6/1967	Diehl	242/25 A
3,721,393	3/1973	Croisettere	242/25 A

FOREIGN PATENTS OR APPLICATIONS

1,199,734	7/1970	United Kingdom	242/25 A



1. Continuous spooling apparatus for wire and similar strands having two co-axially spaced, independently driven, removable reels, a distributor head arranged to deliver the strand to the reels, variable drive means for the reels permitting the reels to be driven in sequence at a varying rate of rotation such that the peripheral speed at the surface of the wound strand remains constant, means for transferring discharge of the strand from the distributor head from toward a full reel to toward an empty reel, notched catcher plates positioned adjoining adjacent flanges of the full and empty reels and rotatable therewith, stationary cutters positioned approximately diametrically opposite to the distributor and adjacent respective catcher plates arranged to sever the strand, a wire carrier of pivotable cradle form positioned intermediate the empty and full reels rotatable co-axially with the reels from a position adjacent the distributor head receiving the strand upon transfer of the feed from toward the full reel to toward the empty reel to a position approaching the cutter, the wire carrier including a cradle pivotable between a retaining position in which the strand is retained by the cradle irrespective of the position of the wire carrier and is held clear of the notched catcher plates and a release position in which the strand is released to the notched catcher plates.

B 432,594

SERVO STEERING SYSTEM FOR VEHICLES, ESPECIALLY MOTOR VEHICLES

Manfred H. Burckhardt, Waiblingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany

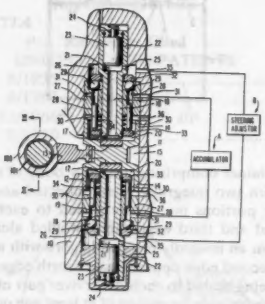
Filed Jan. 11, 1974, Ser. No. 432,594
Claims priority, application Germany, Jan. 12, 1973, 2301415
Int. Cl.² B62D 5/08
U.S. Cl. 137—627.5 12 Claims

References Cited
UNITED STATES PATENTS

2,954,837	10/1960	Ziskal	180/79.2 R
3,414,073	12/1968	Hurwitz	180/79.2 R
3,428,143	2/1969	King et al.	180/79.2 R

FOREIGN PATENTS OR APPLICATIONS

833,611	4/1960	United Kingdom	91/434
1,025,281	2/1958	Germany	180/79.2 R
1,214,554	1/1964	Germany	180/79.2 R



1. A servo-steering system for vehicles in which a a steering nut is movable on a steering spindle, and in which adjusting means are coordinated to the steering nut which are acted upon by a pressure medium, whose pressure is controllable by a control means in dependence on the deflection of the steering nut, characterized in that a high pressure accumulator means serves as pressure medium source, said control means being provided with space means conducting the working pressure, the inflow of the pressure medium to said space means being substantially completely interrupted by said control means in the normal position of the steering nut, the steering nut engages with a finger into a guide sleeve means which is located in a bore provided in a portion of the control means between two control piston means, and valve closure plate means in said guide sleeve means which are spaced at a slight distance from the end faces of the control piston means forming valve seats for the valve closure plate means, one control sleeve means each is fixedly arranged in the bore of the portion of said control means on both sides of the guide sleeve means, said control sleeve means accommodating centrally thereof the control piston means and at the end face thereof an inlet valve means leading to said space means conducting the working pressure, several similar axially parallel bores are provided in each control sleeve means, which are connected with the inlet from the accumulator means, said last-mentioned bores being closed in the direction toward the working space means by first valve means and receiving compensating piston means in the direction toward the guide sleeve means, and at least the compensating piston means being supported at abutment means fixedly arranged on the control piston means.

B 452,944

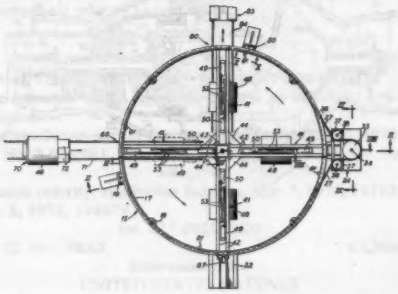
PAPER ROLL HANDLING APPARATUS

Lawrence A. Brenner, Brookfield, Wis., and Charles H. Scholl, Vermilion, Ohio, assignors to Beloit Corporation, Beloit, Wis.

Filed Mar. 20, 1974, Ser. No. 452,944
Int. Cl.² B65G 29/00
U.S. Cl. 198—25 24 Claims

References Cited
UNITED STATES PATENTS

1,615,115	1/1927	Durhan, Jr.	214/DIG. 4
1,736,016	11/1929	Rosener	214/DIG. 4
2,431,320	11/1947	Fischer	198/210 X
3,142,486	7/1964	Viescas	198/210 X
3,195,444	7/1965	McLean	214/1 BC X
3,329,369	7/1967	Guthrie	242/58.6
3,384,048	5/1968	Kutcher	198/210 X
3,659,729	5/1972	Lamkemeyer	198/210 X



1. Apparatus for handling paper rolls provided with center cores, comprising:

an elevated rotary carriage;

means supporting said carriage for rotation about a vertical axis;

a plurality of roll-suspending devices carried by said carriage in angularly spaced relation to one another about said axis;

each of said devices having means for supporting engagement within opposite ends of the center cores of the paper rolls;

means for operating said devices for selectively engaging with the roll center cores and suspending the rolls to be carried by said carriage and for releasing the rolls;

means for driving said carriage rotatably to advance the roll-suspending devices successively into a plurality of station positions which are angularly spaced from one another in the direction of rotation of the carriage; and

said carriage comprising a downwardly facing ring, and said supporting means comprising a plurality of stands circumferentially spaced about the ring and having upwardly facing roller means supporting the ring.

B 454,833

FILLING VALVES FOR PRESSURE FUELING DEVICES

Jacques Courant, Epinay-sur-Seine; Robert Gonnet, Unieux, and Marc Thoré, Buc, all of France, assignors to Zenith-Aviation, Levallois-Perret, France

Filed Mar. 26, 1974, Ser. No. 454,833

Claims priority, application France, Apr. 17, 1973, 73.13879

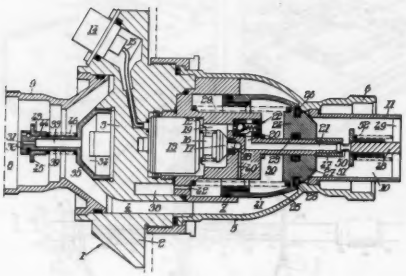
Int. Cl.² F16K *21/00, 31/42*

U.S. Cl. 137—220 4 Claims

References Cited

UNITED STATES PATENTS

2,608,985	9/1952	Arthur	137/222 UX
3,119,405	1/1964	Guy	137/222 X
3,540,462	11/1970	Renzi	137/219
3,545,483	12/1970	Valdenazzi	137/220 UX



2. A filling valve for a pressure refueling device comprising: a hollow body; an annular passage in said body between upstream connection means and downstream connection means; a movable closure unit co-operating with a seat in said passage; means in said body for axially guiding said closure unit and co-operating with said closure unit for limiting an outer chamber forming part of the annular passage and an inner chamber communicating with the upstream connection means; control means for opening and closing communication of said inner chamber and a discharge duct; the pressure of the fuel acting on that surface of the closure unit which limits the outer chamber tending to move the closure member away from its seat, and the pressure of the fuel acting on that surface of the closure unit which limits the inner chamber tending to move the closure unit into its seat, and the resulting force exerted on the closure unit in the opening direction being greater than the force exerted in the closing direction when communication with the discharge duct is fully opened by the control means and conversely when communication with the discharge duct is fully closed by the control means; and means responsive to the flow rate of fuel across the valve for increasing the ratio between the fuel pressure in the inner chamber and the fuel pressure in the outer chamber as the flow rate increases, wherein said inner chamber communicates with said upstream connection means through port means having a cross-sectional flow area which is controlled by said flow rate responsive means and with said downstream connection means through said control means and said discharge duct.

B 459,190

SEALED CONTAINER

Georges Aguettant, l'avenue Jules Carteret, and Louis Doyen, 79, rue de Bourgogne, both of Lyon, France

Filed Apr. 8, 1974, Ser. No. 459,190

Int. Cl.² B65D *33/36*

U.S. Cl. 150—8 6 Claims

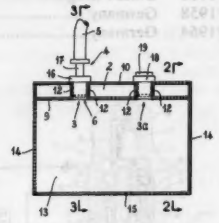
References Cited

UNITED STATES PATENTS

3,173,579	3/1965	Curie	150/8 UX
3,209,752	10/1965	Bujan	150/8 X
3,255,923	6/1966	Soto	222/80
3,340,671	9/1967	Loo	141/329 X

FOREIGN PATENTS OR APPLICATIONS

1,298,941	6/1962	France	150/8



1. A container comprising a hollow body of sealable sheet material with two integrally interconnected and coextensive rectangular portions marginally sealed to each other along first, second and third edges and infolded along the fourth edge to form an inwardly projecting gore with a ridge spaced from said second edge opposite said fourth edge, the flanks of said gore being sealed to each other over part of the length of said fourth edge with formation of at least one outwardly open pouch closed by said ridge and separated thereby from the interior of said body, and a rigid sleeve inserted into said pouch in fluidtight peripheral contact with the surrounding sheet material of said gore.

B 464,491

FILM-FORMING POLYMER MODIFIED WITH A FLUOROALIPHATIC RADICAL CONTAINING COMPOUND AND HAIR STYLING COMPOSITION THEREOF

Frank J. Pavlik, St. Paul, and Robert L. Hansen, Roseville, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 758,630, Sept. 9, 1968, abandoned. This application Apr. 26, 1974, Ser. No. 464,491

Int. Cl.² A45D *7/00;* A61K *7/11*

U.S. Cl. 132—7 7 Claims

References Cited

UNITED STATES PATENTS

3,026,250	3/1962	Coyner	424/71 X
3,137,713	6/1964	Shen et al.	424/71 X
3,245,817	4/1966	Lovness	260/556 F X
3,384,627	5/1968	Anello et al.	260/80.8 X

1. A method of styling hair comprising combing and styling hair into a desired configuration and applying to the thus configured hair a liquid hair styling composition capable of holding hair in place under humid and windy conditions while imparting a soft hand and sheen to the hair and which is easily removed by shampooing comprising a polymer solvent and in combination therewith a fluoroaliphatic radical containing modified film-forming polymer, said fluoroaliphatic radical being a fluorinated saturated monovalent nonaromatic radical containing from 3 to 20 carbon atoms, in which the carbon atoms of the chain are substituted only by fluorine, chlorine

or hydrogen atoms with no more then one hydrogen or chlorine atom for every two carbon atoms, and in which a divalent oxygen or trivalent nitrogen atom, bonded only to carbon atoms, can be present in the aliphatic chain, said polymer being a linear polar polymer having a specific viscosity in one percent solution in methyl ethyl ketone at 25°C. of at least 0.05, having pendant fluoroaliphatic groups contributing 0.5 to 15 percent by weight fluorine to the polymer, said polymer also containing between five and 22 percent by weight pendant carboxyl groups.

B 487,078

FALSE-TWISTING ARRANGEMENT FOR SYNTHETIC YARNS

Edgar Muschelknautz, Leverkusen; Hans Lenz, Dormagen-Hackenbroich, and Heiko Herold, Dormagen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 10, 1974, Ser. No. 487,078

Claims priority, application Germany, July 24, 1973, 2337527

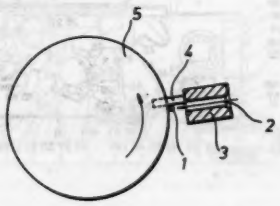
Int. Cl.² D02G *1/02*

U.S. Cl. 57—77.4 **7 Claims**

References Cited

UNITED STATES PATENTS

2,718,111	9/1955	Brown	57/77.4
3,094,834	6/1963	Deeley et al.	57/77.4 X
3,287,890	11/1966	McIntosh et al.	57/77.4
3,527,043	9/1970	Sabaton	57/51.6 X



1. An apparatus suitable for false twisting of synthetic yarn comprising means for twisting of the yarn comprising a movably mounted edge over which the yarn can be drawn for the twisting thereof, take-off means for drawing the yarn over the moving edge of the twisting means, a yarn guide for preventing entrainment of the yarn by the moving edge, the improvement which comprises means for directing a jet of gas or liquid onto the yarn to press the yarn against the moving edge during the twisting thereof.

B 488,836

STEAM GENERATOR, TUBE-BUNDLE CENTERING ARRANGEMENT

Wolfgang Berger, Erlangen, and Hans Röttger, Weiher, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed July 15, 1974, Ser. No. 488,836

Claims priority, application Germany, July 25, 1973, 2337791

Int. Cl.² F28F *9/00*

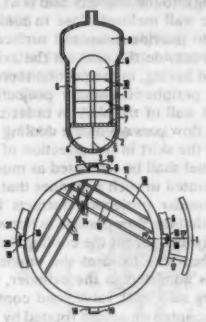
U.S. Cl. 165—162 **4 Claims**

References Cited

UNITED STATES PATENTS

2,477,950	8/1949	Bailey	165/162 X
3,420,297	1/1969	Romanos	165/162
3,677,339	7/1972	Perrin et al.	165/162

1. A steam generator having a tube sheet, a heat-exchanger tube bundle having ends mounted in said tube sheet and extending from said tube sheet, a cylindrical wall surrounding said tube bundle, at least one tube bundle tube spacer grid having a ring encircling said bundle inside of said cylindrical wall, and means for connecting said ring to said wall; wherein the improvement comprises said means being in the form of



keys and keyways extending radially with respect to said ring and wall and relatively sliding longitudinally with respect to said tube bundle and wall when said ring and said wall thermally move relative to each other, while locking said ring non-rotatively relative to said wall.

B 491,774

VALVE FOR EXTERNAL COMBUSTION MOTOR

Gilbert Lucien Van Avermaete, 20, rue de l'Europe, Arlon, Belgium

Continuation-in-part of Ser. No. 238,769, March 28, 1972, Pat. No. 3,826,081. This application July 25, 1974, Ser. No. 491,774

Claims priority, application Belgium, Apr. 7, 1971, 101925; Mar. 3, 1972, 114678

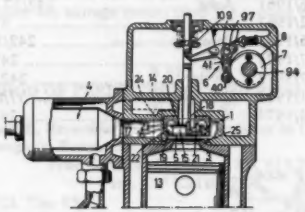
Int. Cl.² F02G *3/00*

U.S. Cl. 60—39.63 **6 Claims**

References Cited

UNITED STATES PATENTS

1,651,402	12/1927	Midgley	123/90.18 X
3,113,561	12/1963	Heintz	123/90.18 X
3,826,081	7/1974	Van Avermaete	60/39.63
3,839.858	10/1974	Van Avermaete	60/39.6



1. In a piston motor including an expansion cylinder wherein a pressurized fluid expands and a combustion chamber at constant pressure wherein said fluid is subjected to an increase of pressure, a feed channel connected between said combustion chamber and said expansion cylinder and an inlet valve having a stem and a head mounted in said feed channel for controlling the flow of said pressurized fluid into said expansion cylinder, the improvement which comprises a cooling device for said valve, said cooling device including a feed pipe for pressurized cooling fluid at lower temperature than the temperature of the fluid originating from the combustion

chamber and a stationary skirt fitted inside said feed channel and surrounding the stem of said inlet valve and having an edge extending to the vicinity of the inlet valve head in order to surround the latter over at least part of the height of its periphery, said feed pipe for pressurized cooling fluid at lower temperature opening into the inside of said skirt, said skirt also having a peripheric wall inclined close to said skirt edge in such a manner as to provide a tapered surface, the apex of which is positioned outside the skirt on the axis of the valve stem, the valve head having, in the portion thereof positioned inside the skirt, a peripheric annular projection extending toward the inclined wall of the skirt in order that, when the valve is closed, the flow passage of the cooling fluid between the valve head and the skirt in the direction of the high temperature fluid channel shall be restricted as much as possible, the valve being operated in such a manner that, on the opening thereof, the annular projection retracts from the said tapered surface, so that the flow passage in between them shall increase very rapidly and permit the cooling fluid to scavenge the periphery of the valve head at the moment when high temperature fluid is admitted to the cylinder, and a control device for operating said inlet valve, said control device including two cams mounted on a shaft rotated by the motor and actuating through a moving equipment of Caprotti type, the inlet, said moving equipment comprising a rocker-lever pivoting around a fixed axis and the ends of which each support a follower cooperating with one of said cams, one of said cams being locked on said shaft while the other cam is free mounted on the latter, a sliding means being provided on the shaft to control the angular movement of the moving cam with respect to the cam locked on the shaft, the latter having a threaded portion forming an endless screw with very elongated pitch cooperating with the sliding means and causing when the latter longitudinally moves in parallel to the shaft axis, the rotation of the moving cam around the latter, by means of at least one rod parallel to the axis of said shaft, said rod being fixed to the moving cam and being able to freely slide in an aperture provided in the sliding means.

B 492,373

METHOD AND APPARATUS FOR HANDLING LINEAR ELEMENTS

John L. Patterson, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed July 29, 1974, Ser. No. 492,373

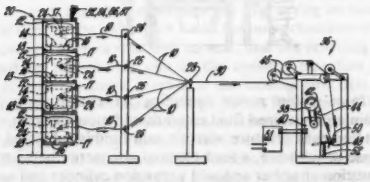
Int. Cl.² B65H *63/00*

U.S. Cl. 242—36 **15 Claims**

References Cited

UNITED STATES PATENTS

2,989,796	6/1961	Ashe	242/37 R X
3,114,233	12/1963	Guri	57/81
3,189,288	6/1965	Petersen	242/37 R
3,592,400	7/1971	Gith	242/36
3,746,276	7/1973	Stotler	242/129
3,772,524	11/1973	Erbstein	57/81 X
3,801,031	4/1974	Kamp et al.	242/36



1. A method for handling a linear element comprising:

a. linearly advancing a linear element along a given path such that a beam of light directed to the element is reflected therefrom with varying intensity with regard to the speed of advancement of the element;

b. directing a beam of light to the element for reflection therefrom;

c. sensing changes in the intensity of the light reflected from the element as an indication of changes in the speed of its advancement;

d. supplying a signal which varies in response to changes in intensity of the reflected light; and

e. controlling advancement of the linear element in response to the signal.

B 500,171

ELECTROPHOTOGRAPHIC COPYING APPARATUS

Yasuhiko Doi, Toyokawa; Shunji Yamamoto, Shinshiro; Osamu Okada, Toyokawa; Takashi Hikosaka, and Masamichi Hayashi, both of Aichi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 23, 1974, Ser. No. 500,171

Claims priority, application Japan, Sept. 7, 1973, 48-101372

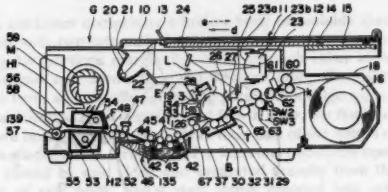
Int. Cl.² G03G *15/18, 15/00*

U.S. Cl. 355—11 **5 Claims**

References Cited

UNITED STATES PATENTS

3,015,304	1/1962	Carlson et al.	355/11 X
3,240,596	3/1966	Medley et al.	96/1 TE
3,630,608	12/1971	Sage	355/8
3,705,768	12/1972	Moraw et al.	355/11 X



1. An electrophotographic copying apparatus of the image transfer type, comprising:

a reciprocatable platform on which an original to be copied may be placed;

a rotatable drum disposed below said platform and having a photoreceptor surface onto which an image of the original to be copied is projected, said drum being adapted to rotate synchronously with movement of said platform disposed above said drum;

means disposed around said drum and including a corona charging means for applying uniform charges onto said drum, an exposure slit means through which an image of the original is projected by reflecting the image through a plurality of mirrors and a lens onto said drum, an electrostatic latent image being formed thereon, an image transfer means for transferring the thus formed electrostatic latent image onto a copying paper, a separating means for separating said copying paper from the drum, and an erasing means for erasing residual charges from the drum;

a paper feeding means disposed along a substantially V-shaped path and including a supporting means, a plurality of pairs of rollers arranged between said image transfer means and said supporting means for supporting the copying paper in the form of a roll, said arrangement of rollers forming the feeding path of said copying paper substantially parallel to a finally reflected path of the original image through said slit;

a cutting means disposed along said feeding path for cutting said copying paper;

a developing means including developing solution disposed at about an apex of said V-shaped path;

a feeding path extending upward from said developing means so as to substantially form the V-shaped path and including a squeezing roller for squeezing excess developing solution from a developed copying paper, an absorbing roller for absorbing excess developing solution from the copying paper, and a fixing device for heat fixing said developed image on the copying paper, said drum being positioned along the feeding path between said pairs of rollers and said developing means, having a diameter of 50 to 100 mm and adapted to rotate more than once for forming an electrostatic latent image of the original.

B 510,278

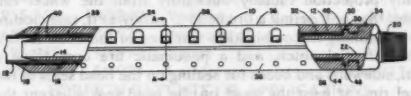
TUBING CONNECTOR

Carl E. Lindberg, New Orleans, La., assignor to Continental Oil Company, Ponca City, Okla.

Filed Sept. 30, 1974, Ser. No. 510,278
Int. Cl.² F16D *1/00*
U.S. Cl. 403—341 **7 Claims**

References Cited
UNITED STATES PATENTS

2,518,243	8/1950	Meyers	403/360 X
2,557,472	6/1951	Rulon	403/313 X
2,650,106	8/1953	French	403/110 X
3,224,800	12/1965	Fisher	403/118
3,584,473	6/1971	MacDonald	403/366 X



1. A connector for joining a tool to a substantially rigid metallic tubing, said connector comprising:

a. a substantially rigid tubular member, having an outer diameter smaller than the inside diameter of said metallic tubing, said tubular member being positioned inside said metallic tubing with said outer diameter of said tubular member being in slidable contact with the inside diameter of said metallic tubing;

b. a tool joining means axially attached to one end said tubular member said one end extending beyond an end of said metallic tubing;

c. an elongated substantially tubularly shaped clamp means having means along its length for urging the inner diameter of said clamp means into gripping contact with the outer diameter of said metallic tubing and urging said inner diameter of said metallic tubing into contact with said outer diameter of said tubular member; and

d. means for connecting said clamp means to said one end of said tubular member to prevent axial movement of said clamp means with respect to said metallic tubing and said tubular member

so that when said inner diameter of said clamp means is urged into gripping contact with said outer diameter of said metallic tubing and said inner diameter of said metallic tubing is urged into contact with said outer diameter of said tubular member thus joining said connector to said tubing.

B 511,907

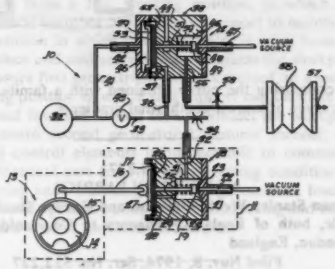
VEHICLE SPEED CONTROL

David F. Reed, Kansas City, Mo., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Oct. 3, 1974, Ser. No. 511,907
Int. Cl.² B60K *31/00*
U.S. Cl. 180—108 **19 Claims**

References Cited
UNITED STATES PATENTS

3,198,280	8/1965	Ostrom	180/108
3,249,176	5/1966	Dangler	123/103 R X
3,322,227	5/1967	Thorner	180/108
3,368,640	2/1968	Bremer et al.	180/108



1. A speed control device for an automotive vehicle comprising a speed sensing device for the vehicle, a source of vacuum controlled by the sensing device to vary said vacuum with vehicle speed, a fixed volume storage means for said variable vacuum and a differential control means operatively connected to the sensing device to receive a vacuum signal therefrom, including a control valve having a diaphragm, a vacuum control valve member operatively connected to said diaphragm, one side of said diaphragm communicating with said sensing device and the opposite side communicating with said storage means, a second vacuum source controlled by the vacuum control valve member to provide a signal from the control valve, throttle actuating means controlled by the signal from the control valve, and interrupting means between the sensing means and the storage means which is actuatable to isolate the storage means from the sensing device.

B 513,791

METHOD OF PREDICTING GEOTHERMAL GRADIENTS IN WELLS

Edward B. Reynolds, Spring, Tex., assignor to Continental Oil Company, Ponca City, Okla.

Filed Oct. 10, 1974, Ser. No. 513,791
Int. Cl.² E21B *47/06*
U.S. Cl. 73—154 **10 Claims**

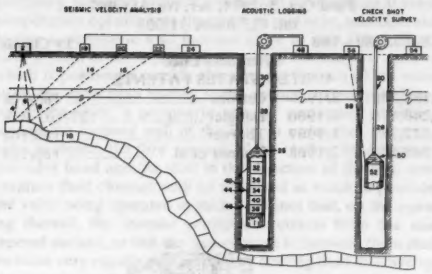
References Cited
UNITED STATES PATENTS

3,618,001	11/1971	Zill	73/152 X
3,805,587	4/1974	Sayer	73/154 X

1. A method of predicting the geothermal gradient of subterranean strata by determining velocity trends in the strata and comparing same with the velocity trends of formations for which geothermal gradients have previously been determined and plotted on semi-logarithmic paper as a family of curves of velocity trends versus geothermal gradients comprising:

a. determining the velocity trend at various depths of a wave propagated through the subterranean strata,

b. plotting the velocity trend versus depth on semi-logarithmic paper to generate a curve, and



c. comparing the curve obtained with a family of similar curves of known geothermal gradients.

B 522,227

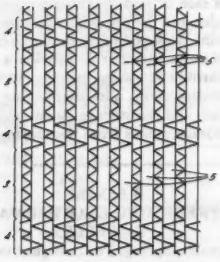
NON-WOVEN FABRICS

Norman Stanley Webb, Oldham, and Gordon Dunbar, Rochdale, both of England, assignors to Courtaulds Limited, London, England

Filed Nov. 8, 1974, Ser. No. 522,227
Int. Cl.² D04B *7/12, 7/14, 9/14, 13/00*
U.S. Cl. 66—190 **6 Claims**

References Cited
UNITED STATES PATENTS

2,890,579	6/1959	Mauersberger	66/84 UX
3,597,941	8/1971	Jindra	66/194
3,664,157	5/1972	Kochta et al.	66/192
3,782,137	1/1974	Hughes	66/192



1. A stitch-bonded non-woven fabric comprising a web of fibres stitch-bonded by wales of chain stitch loops on one side of the fabric which are interconnected on the other side of the fabric by stitch laps, wherein in a first group of successive courses the wales are connected by stitch laps in sets which are not connected by stitch laps to wales in adjacent sets so that the web stands out between adjacent sets in longitudinal stripes and in a second group of successive courses, consisting of less courses than the first group of courses, all the wales are connected by stitch laps so that in the second group of courses the said longitudinal stripes are broken and the second group of courses appear as a transverse bar in which there are no longitudinal stripes in which the web stands out.

B 522,537

PNEUMATIC TIRE AND WHEEL RIM ASSEMBLIES

William Eric Mitchell, Coventry, England, assignor to Dunlop Limited, Birmingham, England

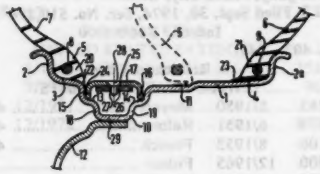
Continuation-in-part of Ser. No. 420,596, Nov. 30, 1973, Pat. No. 3,918,508. This application Nov. 11, 1974, Ser. No. 522,537
Claims priority, application United Kingdom, Dec. 6, 1972, 56311/72; June 30, 1973, 31288/73; Nov. 9, 1974, 48594/74; Nov. 9, 1974, 48592/74; June 30, 1973, 31287/73
Int. Cl.² B60C *15/06*
U.S. Cl. 152—379 S **8 Claims**

References Cited
UNITED STATES PATENTS

3,638,701	2/1972	Rossler	152/158

FOREIGN PATENTS OR APPLICATIONS

222,768	10/1924	France	152/381
722,953	1/1932	France	152/381



1. A pneumatic tire and wheel rim assembly capable of being run in a deflated condition comprising a wheel rim having a pair of bead seats, and a circumferential well disposed between the bead seats, closure means for the well free of any projection radially outwardly from the wheel rim greater than will permit a tire bead to pass over it, said closure means defining in combination with one of the bead seats a circumferential notch, and a pneumatic tire comprising a tread, sidewalls and beads for seating on the bead seats of the wheel rim, at least the bead on the bead seat adjacent the notch having an extended toe portion projecting into the notch to restrain the bead from axial inward displacement.

B 536,923

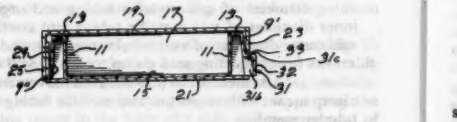
CONTAINER AND CLOSURE

Edward Mayled, 133 Duke of Kent, Pointe Claire, Quebec, Canada

Filed Dec. 23, 1974, Ser. No. 536,923
Int. Cl.² B65D *5/38, 13/06*
U.S. Cl. 206—1.5 **4 Claims**

References Cited
UNITED STATES PATENTS

1,772,744	8/1930	Barry	220/8
1,822,576	9/1931	Greue	229/9
2,686,627	8/1954	McElwee	229/19
3,051,366	8/1962	Sandstrom	229/9
3,568,827	3/1971	Haring	206/1.5



1. An improved package comprising a container and an enclosure having at least one open end; the container adapted to be inserted into the enclosure throuugh the at least one open end thereof; the container and the enclosure being of

substantially equal dimensions and having cooperating means on at least one pair of adjacent walls, the cooperating means comprises projection means situated on at least one wall of the container and retaining means located in at least one adjacent wall of the enclosure, the projection means including a continuous surface portion extending outwardly therefrom, the retaining means comprising an opening situated in at least one side wall of the enclosure, the continuous surface portion of the projection means adapted to releasably engage edges of one of the at least one opening forming the retaining means, whereby engagement between the continuous surface portion and the edges of one of the at least one opening provide a positive connection between the projection means and the retaining means whereby depression of the projection means out of engagement with the retaining means must be effected in order to disengage the cooperating means.

B 540,888

MEASURING DEVICE FOR GAUGING MECHANICAL PIECES IN PARTICULAR PIECES INCLUDING ROTATION SURFACES

Gastone Albertazzi, Bologna, Italy, assignor to Finike Italiana Marposs-Soc. In Accomandita Semplice di Mario Possati & C., Bentivoglio, Italy

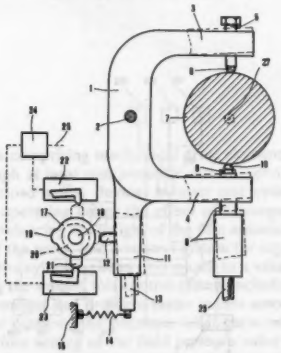
Continuation of Ser. No. 363,258, May 23, 1973. This application Jan. 14, 1975, Ser. No. 540,888
Claims priority, application Italy, May 23, 1972, 3436/72
Int. Cl.² G01B *5/08, 5/20*
U.S. Cl. 33—143 F **6 Claims**

References Cited
UNITED STATES PATENTS

1,425,283	8/1922	Pratt	33/147 H
2,353,813	7/1944	Deeren	33/178 E
2,547,719	4/1951	Rosser	33/174 Q
2,627,119	2/1953	Graham	33/147 N
2,688,192	9/1954	Mennesson	33/178 R
2,955,358	10/1960	Walkling	33/143 F
3,688,411	9/1972	Asano et al.	33/143 L
3,795,055	3/1974	Zucco	33/174 Q
3,808,695	5/1974	La Moreux	33/174 Q

FOREIGN PATENTS OR APPLICATIONS

615,024	1/1961	Italy	33/178 Q



5. A measuring device for checking mechanical workpieces supported to rotate about a determined fixed axis, comprising:

mounting means defining a fixed rotational axis parallel to the rotational axis of the workpiece to be checked; a support mounted on said mounting means rotatable about the rotational axis defined by said mounting means, said support comprising a first arm and a second arm arranged at opposite sides of said rotational axis defined by said mounting means; a first feeler fixed on said first arm of said support;

A measuring head fixed on said second arm of said support and comprising a movable second feeler aligned with said first feeler along a line substantially intersecting the rotational axis of the workpiece, said line being substantially perpendicular to the plane defined by said determined fixed axis and fixed rotational axis; resilient means coupled to said support for urging said first feeler against the workpiece; an electrical unit connected to said measuring head for detecting and visualizing the measurements made; and

commutation and reference means comprising first control elements for commutating said support and second control elements for commutating said electrical unit; said first control elements including a mechanical member movable from a first working position, in which said mechanical member contacts said support to maintain it in a position in which said first feeler is apart from the workpiece and said second feeler contacts the workpiece to measure first geometrical features thereof, to a second working position in which said support can oscillate and both said first and second feelers contact the workpiece to measure second geometrical features thereof; said second control elements being movable to commutate said electrical unit from a first operating condition for measuring and visualizing said first geometrical features to a second operation condition for measuring and visualizing said second geometrical features.

B 545,856

AIR PRESSURE MODULATED BRAKE VALVE SYSTEM

Lawrence Francis Schexnayder, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

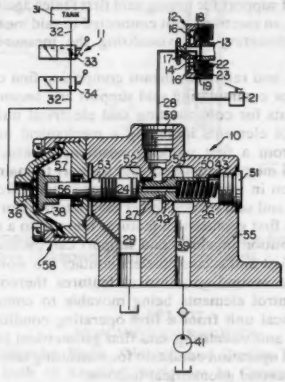
Filed Jan. 31, 1975, Ser. No. 545,856
Int. Cl.² B60T *13/22*
U.S. Cl. 303—71 **9 Claims**

References Cited
UNITED STATES PATENTS

3,259,216	7/1966	Klaus et al.	188/264 F
3,423,136	1/1969	Lohbauer	303/54
3,511,276	5/1970	Jessen et al.	303/9 UX
3,547,234	12/1970	Cummins et al.	303/9 X
3,586,138	6/1971	Engle	188/265
3,606,485	9/1971	Scott	303/23 R
3,647,030	3/1972	Burnett	188/170 X
3,650,568	3/1972	Poplawski	303/9 X

1. Modulating valve means for modulating the pressure of the operating fluid of a fluid pressure operated brake mechanism, said valve means including; a housing block, said housing block including first bore means and second, third, and fourth bore means in direct fluid communication with said first bore means, valve spool means at least partially disposed movably within said first bore means for selectively blocking and permitting fluid flow communication between said fourth bore means and said second bore means and between said fourth bore means and said third bore means, said spool means being a unitary member including a rod extension portion at one of two opposite ends thereof, said extension portion extending without said first bore means and without said housing block into a chamber housing means adjacent said housing block, said chamber housing means including first and second chambers separated by resilient diaphragm means, said resilient diaphragm means being in direct engagement with said extension portion of said unitary member, said chamber housing means including inlet passage means for communicating said first chamber with a regulatable source of secondary fluid under pressure, said modulating valve means performing the function of modulating the pressure of said operating fluid in response to the pressure of said secondary fluid in said first chamber, said modulating valve spool means unitary member having first and second opposite end portions,

said first end portion being contiguous with said rod extension portion and said second end portion being disposed within a spring-pressure chamber at one end of said first bore means, said valve spool means unitary member including passageway means for constantly communicating said spring-pressure



chamber with said fourth bore means, said spool means unitary member being urged in a first direction by the pressure extent in said spring-pressure chamber and being urged in a second opposite direction by said secondary fluid pressure extant in said first chamber.

B 555,456

MULTILEVEL VULCANIZING PRESS

Karl-Friedrich Stettes, Dabringhausen, and Hans-Joachim Körber, Witzhelden, both of Germany, assignors to Goetzewerke Friedrich Goetze A.G., Burscheid, Germany

Filed Mar. 5, 1975, Ser. No. 555,456

Claims priority, application Germany, Mar. 5, 1974, 2410384

Int. Cl.² B29H *5/20;* **B29J** *5/00;* **B29H** *7/00;* **B29C** *7/00, 17/00*

U.S. Cl. 425—339 **5 Claims**

References Cited

UNITED STATES PATENTS

1,291,637	1/1919	Burkhardt	425/338
2,543,582	2/1951	Lyijynen	425/339 X
3,068,512	12/1962	van Houten	425/338
3,206,800	9/1965	Müller	425/339 X
3,242,532	3/1966	Borah	425/338
3,611,482	10/1971	Hutz	425/338 X
3,824,058	7/1974	Axer et al.	425/338

FOREIGN PATENTS OR APPLICATIONS

1,273,141	8/1961	France
1,167,011	4/1964	Germany

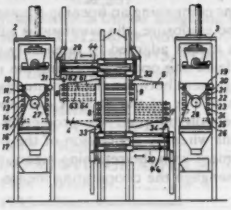
1. Multilevel vulcanizing press comprising:

a. a press housing containing at least two press levels, with each press level capable of receiving a molding tool which can be opened and closed within the press housing, with each molding tool being comprised of a plurality of molding plates and which can be opened at a right angle to the mold parting plane;

b. a first servicing station on one side of said housing for accommodating a molding tool from each level of the press housing;

c. a second servicing station on another side of said housing for accommodating a molding tool from each level of the press housing;

d. a first holding station between the press housing and the first servicing station for receiving a molding tool from each level of the press housing;



e. a second holding station between the press housing and the second servicing station for receiving a molding tool from each level of the press housing; and

f. guide means for guiding each molding tool from the press housing into one of the holding stations and into one of the servicing stations and vice versa.

B 561,165

PROCESS AND APPARATUS FOR ACTUATING THE RAM WEIGHT COMPENSATION MECHANISM OF A PRESS

Franz Schneider, and Burkhard Schumann, both of Goppingen, Germany, assignors to L. Schuler GmbH, Goppingen, Germany

Filed Mar. 24, 1975, Ser. No. 561,165

Claims priority, application Germany, Mar. 26, 1974, 2414409

Int. Cl.² B30B *13/00*

U.S. Cl. 100—35 **21 Claims**

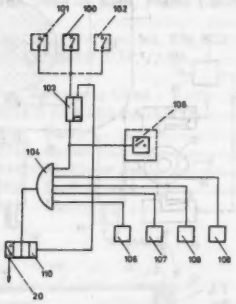
References Cited

UNITED STATES PATENTS

2,784,665	3/1957	Georgeff	100/259 X
3,115,086	12/1963	Stimmel	100/48

FOREIGN PATENTS OR APPLICATIONS

1,348,627	3/1974	United Kingdom	100/259



1. A process for the positive actuation of a weight compensating mechanism for a ram of a press comprising the steps of detecting at least one condition indicative of the changing of a tool set of the press, preventing working operation of the press in response to the detection of a condition indicative of the changing of a tool set, and subsequently initiating operation of the weight compensating mechanism for the ram of the press.

B 561,166

PRESS WITH HYDRAULIC OVERLOAD SAFETY DEVICE AND RAM WEIGHT COUNTERBALANCING MECHANISM

Eugen Waller, Goeppingen; Wolfram Büchler, Donzdorf; Rolf Kellenbenz, Goeppingen; Franz Schneider, Goeppingen, and Burkhard Schumann, Goeppingen, all of Germany, assignors to L. Schuler GmbH, Goeppingen, Germany

Filed Mar. 24, 1975, Ser. No. 561,166

Claims priority, application Germany, Apr. 3, 1974, 2416102; Jan. 15, 1975, 2501275

Int. Cl.² B30B *15/28, 15/14*

U.S. Cl. 100—48 20 Claims

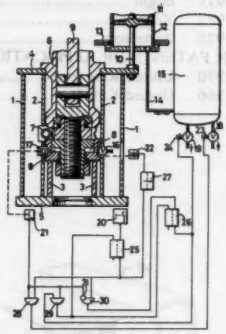
References Cited

UNITED STATES PATENTS

2,748,665	3/1957	Goergeff	100/259 X
3,115,086	12/1963	Stimmel	100/48

FOREIGN PATENTS OR APPLICATIONS

1,348,627	3/1974	United Kingdom	100/259



1. A press comprising mechanical drive elements acting on a ram through at least one pressure cushion serving as a hydraulic overload safety device, at least one cylinder-piston unit means operating under the effect of a compressed fluid for counterbalancing the weight of the ram associated with an upper die of the press, and a control system for adjusting fluid pressure in the cylinder-piston unit means to a value for counterbalancing the weight, this control system including pressure relief valve means and pressure meter means associated with the pressure cushion, the pressure relief valve means being operable before setting of the fluid pressure value for release of pressure from the pressure cushion, the pressure meter means accurately detecting the pressure in the pressure cushion in a measuring range including a predetermined value, actuating means for initiating the setting of a fluid pressure value for counterbalancing the weight, the pressure relief valve means being responsive to the actuating means for operation thereof, and supply valve means and discharge valve means for supplying and discharging compressed fluid to and/or from the cylinder-piston unit means, the supply and discharge valve means being responsive to the actuating means and the pressure meter means for operation thereof.

B 562,519

FLOODING WITH MICELLAR DISPERSIONS CONTAINING PETROLEUM SULFONATES OBTAINED BY SULFONATING WHOLE OR TOPPED CRUDE OIL

Mark A. Plummer; Donald E. Schroeder, Jr., and Wayne O. Roszelle, all of Littleton, Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Mar. 27, 1975, Ser. No. 562,519

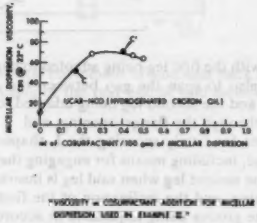
Int. Cl.² E21B *43/22*

U.S. Cl. 166—273 14 Claims

References Cited

UNITED STATES PATENTS

3,254,714	6/1966	Gogarty et al.	166/274
3,275,075	9/1966	Gogarty et al.	166/274
3,330,345	7/1967	Henderson et al.	166/273
3,477,511	11/1969	Jones et al.	166/275 X
3,536,136	10/1970	Jones	166/252
3,753,465	8/1973	Denekas	166/252
3,827,496	8/1974	Schroeder	166/274 X



"VISCOSITY vs. COSURFACTANT ADDITION FOR MICELLAR DISPERSION USED IN EXAMPLE II."

1. In a process of recovering hydrocarbon from a subterranean formation having at least one injection means in fluid communication with at least one production means and wherein a micellar dispersion comprised of water, hydrocarbon, cosurfactant, electrolyte and petroleum sulfonate obtained by sulfonating whole or topped crude oil is injected into the formation and displaced toward the production means to recover hydrocarbon therethrough, the improvement comprising incorporating amounts of the cosurfactant into the micellar dispersion in excess of the amounts required to cause the micellar dispersion to go through a maximum viscosity and to establish a desired viscosity for the flooding of the subterranean formation, and then injecting the micellar dispersion into the formation.

B 565,754

MEANS FOR POSITIONING A LONGITUDINAL BEARING

Roy L. Chandler, Arlington, Tex., assignor to L Ray Wood, Arlington, Tex.

Division of Ser. No. 327,426, Jan. 29, 1973, Pat. No. 3,891,132. This application Apr. 7, 1975, Ser. No. 565,754

Int. Cl.² E05D *7/04*

U.S. Cl. 16—129 8 Claims

References Cited

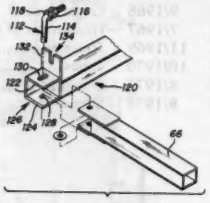
UNITED STATES PATENTS

2,010,468	8/1935	Spencer	16/152 X
2,146,912	2/1939	Phipps	293/65
2,622,266	12/1952	Stehle	16/132
2,708,286	5/1955	Tollefson	16/152 UX
3,107,390	10/1963	Shelton	16/152
3,891,132	6/1975	Chandler	224/42.03 B

1. Apparatus for adjusting the inclination of a bearing surface, comprising:

a. fixed structure having at least two spaced walls forming a groove therebetween, said groove providing access for a rotatable member which may be mated with the bearing surface;

b. an aperture in a first one of the walls;
c. a slot in the second of the two walls, the slot being opposite the aperture in first wall, and said slot extending in a direction which is generally perpendicular to the groove;
d. a flange extending away from the second wall in a direction perpendicular to the opening of the groove, and said flange having an opening which lies in the plane defined by the aperture in the first wall and the slot in the second wall;
e. an L-shaped member having a cylindrical bearing surface along a first leg and an irregular surface along the second

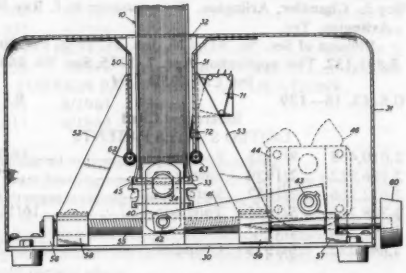


leg, with the first leg being adapted to engage the aperture and also to span the gap between the aperture and the slot, and the second leg being adapted to extend from the slot through the flange opening; and
f. means for firmly securing the L-shaped member to the flange, including means for engaging the irregular surface on the second leg when said leg is inserted into the flange opening, and the inclination of the first leg with respect to the groove being adjustable in accordance with which portion of the second leg's irregular surface is utilized in securing the L-shaped member to the flange.

B 576,385
BOOKBINDING SYSTEM
Henry N. Staats, 1344 Linden Ave., Deerfield, Ill. 60015, and Robert K. Newcomb, 1333 Elmwood, Wilmette, Ill. 60091
Continuation of Ser. No. 265,305, June 22, 1972, abandoned. This application May 12, 1975, Ser. No. 576,385
Int. Cl.² B42C *19/00*
U.S. Cl. 11—1 AD **3 Claims**

References Cited
UNITED STATES PATENTS

3,413,669	12/1968	Thorp	11/5
3,518,143	6/1970	Fuhr	11/1 R
3,531,358	9/1970	Kost et al.	11/1 R X
3,717,366	2/1973	Decker	11/1 R X



1. A binding apparatus for binding a book having a plurality of pages for securement to a generally flat backbone pivotally connected to front and back covers, comprising a generally flat plate, means for selectively heating said plate, means contacting the covers of said book along generally horizontal lines of contact above said plate for maintaining the pages of the book generally vertical on the plate and establishing the thickness of the book without tightly clamping the pages thereof together at the backbone, and means for pivotally rocking said plate about an axis generally parallel to the longitudinal axis of the backbone and lying generally within the plane of the plate whereby adjacent portions of the plate are cyclically moved up and down relative to each other.

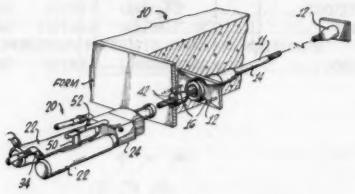
B 591,615
TENSIONING RAM FOR POST-TENSIONING CONCRETE STRUCTURES
Manfred E. A. Wyder, City of Industry, Calif., assignor to Swiss-Aire Instruments, Inc., City of Industry, Calif.
Filed June 30, 1975, Ser. No. 591,615
Int. Cl.² E04C *3/20*; B23P *19/00*; E04C *5/12*
U.S. Cl. 52—225 **10 Claims**

References Cited
UNITED STATES PATENTS

3,011,844	12/1961	Maha et al.	52/225 X
3,084,909	4/1963	Carr	254/51
3,327,380	6/1967	Howlett	52/230 X
3,554,492	1/1971	Beghi	254/29 A
3,658,296	4/1972	Yegge	254/29 A
3,762,027	10/1973	Burtelson	29/452

FOREIGN PATENTS OR APPLICATIONS

1,216,343	12/1970	United Kingdom	52/225
1,018,967	2/1966	United Kingdom	52/225



1. A hydraulic ram of the class described for post-tensioning tendons, which includes:
a hydraulic cylinder having a piston therein;
means holding said cylinder and having a slot therein adapted to receive a tendon extending in a direction parallel to the axis of said cylinder;
gripper means connected to said holding means to receive and hold said tendon;
a nose member attached to said piston for movement therewith;
a plugging punch mounted in said nose member for movement with respect thereto; and
means for moving said plugging punch.

B 597,410

CHAIR CONTROL WITH FRONT TO REAR TORSION BAR

Wendell P. Doerr, Northbrook, Ill., and George F. Janko, Lexington, Ky., assignors to Hoover Ball and Bearing Company, Saline, Mich.

Filed July 21, 1975, Ser. No. 597,410
Int. Cl.[2] A47C 3/00
U.S. Cl. 297—304 6 Claims

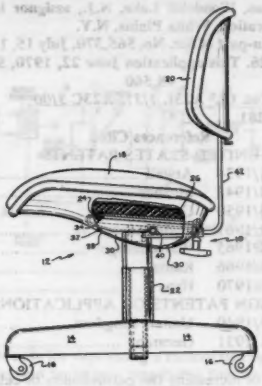
References Cited
UNITED STATES PATENTS

3,598,354	8/1971	Williams	297/304 X
3,602,537	8/1971	Kerstholt	297/304
3,672,721	6/1972	Williams	297/304 X

FOREIGN PATENTS OR APPLICATIONS

422,501	1/1935	United Kingdom	297/354
305,142	9/1968	Sweden	248/273

1. In a chair having a seat supporting frame extending front to rear of the chair, a seat back structure having a lower end portion pivotally supported on said frame and an upper end portion extending upwardly at a position rearwardly of said frame, a torsion bar mounted on said frame at a position extending front to rear thereof, said torsion bar having a front end fixedly secured to said frame and a rear end capable of axial twisting movement relative to said front end, and means connecting said torsion bar rear end to said seat back structure at a position between said lower and upper end portions thereof so that backward tilting movement of said upper end



portion causing pivotal movement of said seat back structure results in said twisting of the rear end of said torsion bar.

CHEMICAL APPLICATIONS

B 048,560
METHOD OF INCREASING THE PERMEABILITY OF CELLULAR MATERIALS
Gerhard J. Haas, Woodcliff Lake, N.J., assignor to General Foods Corporation, White Plains, N.Y.
Continuation-in-part of Ser. No. 565,370, July 15, 1966, Pat. No. 3,535,126. This application June 22, 1970, Ser. No. 48,560
Int. Cl.[2] A23L *1/31;* **A23C** *3/00*
U.S. Cl. 426—281 **11 Claims**

References Cited
UNITED STATES PATENTS

1,944,857	1/1934	Atwell	99/198
2,278,472	4/1942	Musher	99/192
2,509,299	5/1950	Grom	62/62
3,007,319	11/1961	Ogden	99/198
3,216,826	11/1965	Wattenbarger	99/189
3,281,950	11/1966	Kautz	34/5
3,535,126	10/1970	Haas	99/193

FOREIGN PATENTS OR APPLICATIONS

521,715	5/1940	United Kingdom	99/198
538,597	11/1931	Germany	99/198

1. A method of increasing the permeability of cellular food material, without substantially disrupting the cell structure, comprising the steps of:

a. placing the cellular foodstuff in a pressure vessel,

b. raising the pressure in the vessel to greater than about 50 p.s.i.g. with a gas selected from the group consisting of methane, carbon monoxide, nitrogen, dichlorodifluoromethane and air, the pressure being sufficient to permeate the cellular material with the gas.

c. completely freezing said pressurized cellular material at about −20°C. to −25°C., and then

d. releasing the pressure on the completely frozen cellular material.

B 141,968
PROCESS FOR ENCAPSULATING PARTICLES BY IN-SITU FORMATION OF A METAL CARBONATE COATING
Faisal T. Kawar, 3 Dartmouth Ave., Somerville, N.J. 08873
Division of Ser. No. 796,231, Feb. 3, 1969, abandoned. This application May 10, 1971, Ser. No. 141,968
Int. Cl.[2] C05C *9/00*
U.S. Cl. 71—28 **10 Claims**

References Cited
UNITED STATES PATENTS

2,644,769	7/1953	Robinson	117/100 B
2,725,397	11/1955	Dijksman et al.	260/555
3,041,159	6/1962	Smith	117/100 B
3,148,945	9/1964	Griffith et al.	117/100 B
3,362,846	1/1968	Lee et al.	117/169 R

FOREIGN PATENTS OR APPLICATIONS

826,815	1/1960	United Kingdom	117/100 B

1. A process for the encapsulation of particles by substantially water insoluble metallic carbonate salts comprising:

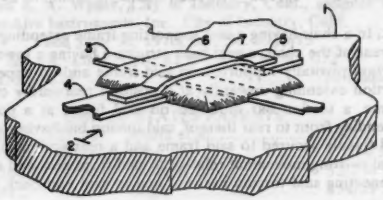
a. coating the particles with a finely divided solid material comprising the corresponding metal hydroxide of the metal carbonate; and

b. subjecting the coated particles to an atmosphere containing carbon dioxide for a time sufficient to at least substantially convert the hydroxide content of said coating to the corresponding carbonate.

B 231,416
METHOD OF MAKING THIN FILM CROSSOVER STRUCTURE
Gabriel Marcantonio, Ottawa, Canada, assignor to Microsystems International Limited, Montreal, Canada
Continuation of Ser. No. 87,542, Nov. 6, 1970, abandoned. This application Mar. 2, 1972, Ser. No. 231,416
Int. Cl.[2] C23C *15/00*
U.S. Cl. 204—192 **4 Claims**

References Cited
UNITED STATES PATENTS

3,377,513	4/1968	Ashby et al.	317/101 CE
3,508,325	4/1970	Perry	317/101 A X
3,525,617	8/1970	Bingham	317/101 CE X



1. In a method of construction a thin film circuit, the steps of:

a. sputtering a first conductive element selected from the group consisting of tantalum, titanium, nichrome, chromium and nickel and depositing second and third conductive elements on opposite sides thereof to one surface of an electrically insulative substrate,

b. screen printing a layer of a low temperature curing insulative dielectric across the first conductive element through a first mask,

c. curing said dielectric, whereby a predetermined acute contact angle between said dielectric and said substrate is formed, and

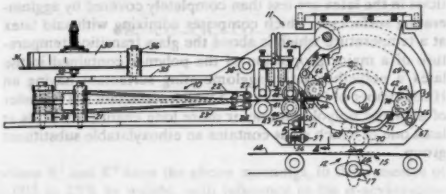
d. sputtering a thin film conductive element over the dielectric between, and in contact with, the second and third conductive elements.

B 288,757
APPLICATOR FOR PRESSURE-SENSITIVE ADHESIVE FASTENERS
Ricahrd P. de Neui, Lake Elmoin, Minn., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.
Filed Sept. 13, 1972, Ser. No. 288,757
Int. Cl.[2] B32B *31/00;* **B31F** *1/00*
U.S. Cl. 156—461 **5 Claims**

References Cited
UNITED STATES PATENTS

1,989,012	1/1935	Kalko	83/328
2,133,341	10/1938	Bronander	156/520 X
2,379,859	7/1945	Barnard	83/592 X
2,642,116	6/1953	Fisher et al.	156/520 X
2,929,437	3/1960	Stevens	156/467
2,934,117	4/1960	Urschel et al.	83/327 X
3,257,678	6/1966	Batchelder et al.	24/DIG. 11
3,322,600	5/1967	Harrison et al.	156/461
3,334,784	8/1967	Morrison	221/7
3,472,724	10/1969	Casey	156/521

3,534,953	10/1970	Appleby	156/443 X
3,642,001	2/1972	Sabee	128/287
3,673,019	6/1972	Erekson	156/66
3,688,771	9/1972	Werner	156/289 X
3,707,442	12/1972	Takahashi et al.	202/173
3,734,835	5/1973	Spicacci	202/173 X
3,763,016	10/1973	Hair	202/185 A



1. An applicator for cutting lengths of pressure-sensitive adhesive tape and applying the same to an article moving along a first path, said applicator comprising:

means for feeding a length of said tape along a second path,

a cutting edge disposed on one side of said second path,

vacuum pad means for supporting a severed length of tape, said vacuum pad means comprising a generally rectangular pad,

cutting means movable with said pad means and cooperating with said cutting edge to sever a length of said tape,

mounting means for supporting said vacuum pad means and said cutting means for movement relative to said cutting edge and for moving said pad means along a third orbital path around an axis past said cutting edge to place the severed lengths of said tape on said pad means and for orienting said pad means to a position generally parallel to and along said first path to apply said severed length of tape to a said article, said mounting means comprising a rotating arm movably supporting said pad, means for rotating said arm about said axis, and cam means for orientating said pad during rotation of said arm and for defining said third orbital path, and

wherein said cutting means is mounted on said arm to move with said pad and to cooperate with said said cutting edge to cut sections from said tape.

B 328,065

PROCESS AND ARRANGEMENT FOR VAPORIZING OF LIQUIDS

Gundolf Rajakovics, Vienna; Heinz Gabernig, Graz, and Günter Peter Klein, Vienna, all of Austria, assignors to Vereinigte Edelstahlwerke AG., formerly Gebr. Boehler & Co. AG., Vienna, Austria

Filed Jan. 30, 1973, Ser. No. 328,065

Claims priority, application Austria, Feb. 2, 1972, 842/72

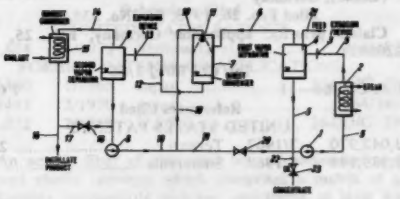
Int. Cl.² B01D *3/00, 3/06*

U.S. Cl. 202—185 A **4 Claims**

References Cited

UNITED STATES PATENTS

2,991,298	7/1961	Raffaeta	203/90
3,152,984	10/1964	Winsche et al.	159/DIG. 12
3,448,017	6/1969	Chang et al.	203/88
3,459,640	8/1969	Tsunawki et al.	203/88
3,475,329	10/1969	Little et al.	203/90
3,480,515	11/1969	Goeldner	203/90



1. In a process for vaporizing a radioactive liquid by a two-step vaporization technique employing first and second flash vaporization stages, wherein liquid is introduced to the first vaporization stage to be circulated, heated and flash-evaporated and wherein vapor resulting from the flash evaporation of the liquid in the first vaporization stage is condensed in a first direct condenser, the improvement wherein the condensing step is accomplished by means of enriched liquid obtained from the second vaporization stage and applied via a circulation pump to the first condenser to form therein a mixture of the enriched liquid obtained from the second vaporization stage and the condensate of the vapor from the first vaporization stage, and wherein the process further comprises the steps of the flash-evaporating said mixture in the second vaporization stage, and recycling a portion of the liquid emerging from the pressure side of the circulating pump to the first vaporization stage.

B 332,442

PROCESS FOR MAKING A METHENAMINE SALT OF AN OPTICALLY ACTIVE ACID

Julius Diamond, Lafayette Hill, Pa., assignor to William H. Rorer, Inc., Fort Washington, Pa.

Filed Mar. 29, 1973, Ser. No. 332,442

Int. Cl.² C07D *251/04*

U.S. Cl. 260—248.5 **1 Claim**

References Cited

UNITED STATES PATENTS

569,429	10/1896	Schiff	260/248.5
2,539,483	1/1951	Ruskin	260/248.5 X
3,168,452	2/1965	Debe	260/248.5 X
3,372,091	3/1968	Harnett et al.	260/248.5 X
3,597,428	8/1971	Hechenbliekner	260/248.5

1. The process for making a salt of methenamine which comprises slowly adding d-mandelic acid to a boiling, stirred suspension of methenamine in a solvent selected from the group consisting of ethyl methyl ketone, acetone, ethanol and isopropanol, in the molar ratio of 0.8:1.0 to 1.0:0.8, removing the heat but continuing the stirring until the mixture cools to room temperature, cooling in an ice-water bath and recovering the formed crystals of methenamine dextro-mandelate.

B 335,783

PROCESS FOR THE MANUFACTURE OF FIBRIDS OF THERMOPLASTICS MATERIALS

Heribert Kuerten, Mannheim; Otto Nagel, Neustadt; Richard Sinn, Ziegelhausen; Werner Weinle, Mannheim, and Peter Engler, Frankenthal, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Feb. 26, 1973, Ser. No. 335,783

Claims priority, application Germany, Feb. 25, 1972, 2208921

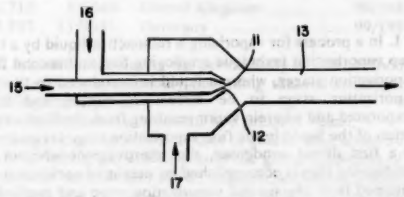
Int. Cl.² B01J 2/06

U.S. Cl. 264—11 **7 Claims**

References Cited

UNITED STATES PATENTS

3,042,970	7/1962	Terenzi	264/11
3,389,194	6/1968	Somerville	264/4



1. A process for the manufacture of fibrids of a thermoplastic polymer material which comprises extruding strands of molten thermoplastic polymer material through orifices of die means into a shear gradient zone between and created by a propulsive jet of liquid flowing from a nozzle adjacent said die means at a velocity of 10–100 meters per second and flowing in the same direction as said strands and a slower moving liquid body entrained by the propulsive jet and located in a liquid-filled zone surrounding said orifices and the propulsive jet, passing said strands, the propulsive jet and the entrained liquid immediately and directly into and through a tubular impulse exchange zone having a mean diameter of two to 20 times the diameter of said nozzle of said propulsive jet and a length of 2–30 times its hydraulic diameter to provide shear stresses acting on said strands within said impulse exchange zone, and causing said strands of molten thermoplastic polymer to solidfy by the cooling of said melt by said liquid and to be broken up into fibrids by said shear stresses within said impulse exchange zone.

B 358,260

METHOD FOR ENLARGING THE PARTICLE SIZE OF POLYMERS PREPARED BY AQUEOUS EMULSION POLYMERIZATION

Clemens Bondy, Harlow, England, assignor to Revertex Ltd., Harlow, England

Filed May 7, 1973, Ser. No. 358,260

Claims priority, application United Kingdom, May 12, 1972, 22507/72

Int. Cl.² C08L 21/02, 25/10, 27/08, 27/22

U.S. Cl. 260—29.7 PT **14 Claims**

References Cited

UNITED STATES PATENTS

2,457,139	12/1948	Fife et al.	260/410.6
2,993,002	7/1961	Wright et al.	252/311.5
3,097,178	7/1963	Townsend et al.	260/29.6
3,288,741	11/1966	Cheng	260/29.7 PT
3,850,868	11/1974	Wismer et al.	260/29.3

1. A method for enlarging the particle size of stabilized latices of water-immiscible polymers prepared by aqueous emulsion polymerization, wherein the dispersed polymer particles in the latex are less than completely covered by agglomerating surfactant, which comprises admixing with said latex at a temperature which is above the glass transition temperature of a major proportion of the polymer contained in the latex a polyethoxylated agglomerating surfactant having an HLB number of from 16 to 19.5 which surfactant is a full ester of aliphatic polyol and one or more long chain fatty acids at least one of which acids contains an ethoxylatable substituent group.

B 359,768

PREPARATION OF 2,5-DIMETHYLFURAN-3-CARBOXYLIC AMIDES

Hans Rupert Merkle, Ludwigshafen, and Hardo Siegel, Speyer, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed May 14, 1973, Ser. No. 359,768

Int. Cl.² C07D 307/66

U.S. Cl. 260—347.3 **4 Claims**

References Cited

UNITED STATES PATENTS

3,806,506	4/1974	Felaver et al.	260/347.3

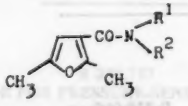
OTHER PUBLICATIONS

Dunlop et al., "The Furans," 1953, p. 642.

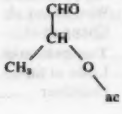
Surrey, "Knoeven Agel Reaction," 1954, pp. 103–104.

Gonzaloz et al., Chem. Abst., Vol. 49, Col. 5422, (1955).

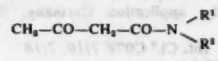
1. A process for the production of a 2,5-dimethylfurancarboxylic amide of the formula



where R^1 and R^2 are identical or different and each denotes hydrogen, phenyl, substituted phenyl, cycloalkyl, substituted cyclohexyl, alkenyl, cycloalkenyl, alkynyl, bicycloalkyl or alkyl of 1 to 4 carbon atoms, wherein an α-acyloxypropionaldehyde of the formula



where ac denotes formyl, acetyl, propionyl, butyryl or isobutyryl, is reacted with an acetoacetamide of the formula



where R^1 and R^2 have the above meanings, in the presence of 0.005 to 25% by weight, with reference to the α-acyloxypropionaldehyde, of an acid catalyst selected from the group consisting of sulfuric acid and p-toluenesulfonic acid.

B 369,379

STATIC LEACHING COPPER ORE

John C. Stauter, and Gerald F. Pace, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed June 12, 1973, Ser. No. 369,379
Int. Cl.² C01G *3/00*; C22B *3/00*
U.S. Cl. 423—27 **5 Claims**

References Cited
UNITED STATES PATENTS

650,019	5/1900	Montgomerie et al.	423/41
899,146	9/1908	Turton	75/101 R
1,131,986	3/1915	Benedict	423/32
1,581,479	4/1926	Van Arsdale et al.	75/101 R
3,777,003	10/1965	Mitterer	75/101 R
3,801,694	4/1974	Pace et al.	75/101 R
3,840,365	10/1974	Hammes et al.	75/101 R
3,863,002	1/1975	Pace et al.	75/101 R

2. A process for static leaching copper mineral values from a source material comprising sizing said source material,

contacting a first portion of said source material with an acid leach solution by adding said solution to said source material and percolating said acid leach solution through said source material,

adding a sweep solution to said source material to displace said acid leach solution,

recovering an effluent pregnant leach liquor from said source material,

segregating the first portion of effluent pregnant leach liquor forming a first portion of concentrated pregnant leach liquor from the last portion of said effluent leach liquor forming a first portion of recycle leach liquor,

contacting a second portion of said source material with said recycle acid leach solution by adding said recycle leach liquor to said source material and percolating said leach liquor through said source material,

adding a sweep solution to said source material to displace said acid leach solution,

recovering an effluent pregnant leach liquor from said source material, and

segregating the first portion of effluent pregnant leach liquor forming a second portion of concentrated pregnant leach liquor from the last portion of said effluent leach liquor forming a second portion of recycle leach liquor.

B 388,675

ACRYLIC FIBER OF IMPROVED PROPERTIES

Kenji Takeya; Hiroshi Suzuki, and Noboru Yamawaki, all of Okayama, Japan, assignors to American Cyanamid Company, Stamford, Conn.

Filed Aug. 15, 1973, Ser. No. 388,675
Int. Cl.² C08L *67/06*
U.S. Cl. 260—873 **9 Claims**

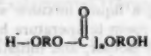
References Cited
UNITED STATES PATENTS

3,773,884	11/1973	Shimosaka et al.	264/182

FOREIGN PATENTS OR APPLICATIONS

40-1460	1/1965	Japan	264/DIG. 29
45-39493	12/1970	Japan	264/182
238,072	2/1969	U.S.S.R.	264/DIG. 29

1. An acrylic fiber of improved hot-wet properties and improved elastic recovery which comprises a matrix of a fiber-forming acrylonitrile polymer containing at least 40 weight percent of acrylonitrile and any balance of one or more monomers copolymerizable therewith, said matrix forming from 50 to 99 weight percent of the total weight of fiber and discontinuously distributed within said matrix from about 1 to 50 weight percent based on the total weight of fiber of a polycarbonate of the formula



wherein R is the residue of an aliphatic or aromatic-alipathic dihydroxy organic compound after esterification to form a polycarbonate and n is an integer sufficient to provide a molecular weight of at least about 18,000, said polycarbonate being present in the form of a plurality of fibrils of a diameter in the range of about 0.05 to 5 microns and a length to diameter ratio of at least 10.

B 389,155

DYEING PROCESS

Edwin Dennis Harvey; David Melville Fawkes; Denis Ronald Lemin, and James Anthony Hawkes, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Aug. 17, 1973, Ser. No. 389,155
Int. Cl.² D06P *3/24*
U.S. Cl. 8—178 R **9 Claims**

References Cited
UNITED STATES PATENTS

3,667,898	6/1972	Bergman et al.	8/94

FOREIGN PATENTS OR APPLICATIONS

1,103,860	2/1968	United Kingdom	8/178 R

1. A process for the batchwise dyeing of polyamide textile materials which comprises treating said material in an aqueous dye liquor containing not more than 10% by volume of at least one organic liquid capable of forming an azeotrope with water and an anionic dye, said dye liquor being maintained during at least part of the treatment at a temperature higher than the boiling point of said azeotrope and under a pressure greater than atmospheric pressure, and then recovering the organic liquid, by distillation before removing the textile material from the aqueous dye liquor.

B 392,798
ISOMERIZATION PROCESS

Ben B. Corson, Milwaukee, Wis., and William T. Gormley, Pittsburgh, Pa., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 123,075, March 10, 1971, abandoned. This application Aug. 29, 1973, Ser. No. 392,798
Int. Cl.² C07D *307/89*
U.S. Cl. 260—346.3 11 Claims

References Cited
UNITED STATES PATENTS

2,764,597	9/1956	Barney	260/346.3
3,169,975	2/1965	Schulz	260/346.3
3,341,555	9/1967	Wooster et al.	260/346.3
3,487,092	12/1969	Cheng et al.	260/346.3
3,647,701	3/1972	Robinson et al.	252/182

OTHER PUBLICATIONS

Shriner et al., The Systematic Identification of Organic Compounds, Fifth Edition, New York, John Wiley, 28–29.

1. An isomerization process for shifting the double bond of the delta-4 isomer of tetrahydrophthalic anhydride comprising isomerizing said delta-4 isomer above about room temperature but below about the melting point of the delta-4 isomer in the presence of a catalytic amount of palladium and, in a minor amount, at least about 0.1 wt.% of a liquid or solid second dicarboxylic acid anhydride, which has a molecular weight in excess of 100, which has a melting point below about 140°C, which is a curing agent for epoxy resins, and which is capable of forming a liquid mixture with said isomer at a temperature above room temperature but below the melting point of the delta-4 isomer, and initiating the isomerization above room temperature but below about the melting point of the delta-4 isomer.

B 403,243
1,5-DISUBSTITUTED BIGUANIDES

Julius Diamond, Lafayette Hill, and Bernard J. Burns, Philadelphia, both of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Continuation of Ser. No. 92,256, Nov. 23, 1970, abandoned. This application Oct. 3, 1973, Ser. No. 403,243
Int. Cl.² C07D *295/14*
U.S. Cl. 260—293.79 21 Claims

References Cited
UNITED STATES PATENTS

2,467,371	4/1949	Curd et al.	260/565
2,510,081	6/1950	Curd et al.	260/565
2,544,827	3/1951	Curd et al.	260/565
2,934,535	4/1960	Sutton	260/249.9
3,119,867	1/1964	Lecher et al.	260/553
3,222,398	12/1965	Brown	260/565
3,456,059	7/1969	Wick et al.	424/326
3,553,263	1/1971	Rosenwald et al.	260/565

OTHER PUBLICATIONS

Yale, J. Med. Chem. 1(2), 121(1959).
Burn et al., Brit. J. Pharmacol. 3, 346–351(1948).

1. 1-(p-trifluoromethoxyphenyl)-5-i-propylbiguanide.

B 412,830
N-SUBSTITUTED β-AMINOETHYLSILANES AND SILOXANES

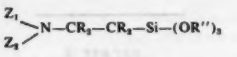
Hans J. Vahlensieck, Wehr; Hans J. Kotzsch, and Claus D. Seiler, both of Rheinfelden, all of Germany, assignors to Dynamit Nobel AG, Troisdorf, Germany

Filed Nov. 5, 1973, Ser. No. 412,830
Claims priority, application Germany, Nov. 4, 1972, 2254117
Int. Cl.² C07F *7/10, 7/18*
U.S. Cl. 260—448.2 N 18 Claims

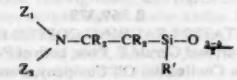
References Cited
UNITED STATES PATENTS

2,919,173	12/1959	Roff	260/448.8 R X
2,955,127	10/1960	Pike	260/448.2 N
3,045,036	7/1962	Jex et al.	260/448.2 N
3,087,909	4/1963	Morehouse et al.	260/448.8 R X
3,203,969	8/1965	Pines et al.	260/448.2 N
3,504,007	3/1970	Owen et al.	260/448.2 N
3,621,047	11/1971	Golitz et al.	260/448.8 R

1. N-substituted β-aminosilanes and -siloxanes of the following general formulae:



and



wherein

b is equal to 0 or 1;

Z_1 is an aliphatic, cycloalkyl or aryl hydrocarbon unsubstituted or substituted with sulfonic acid, ester, halogen, hydroxy, ether, amino, R_3-CO- or R_3—SO_2— , wherein R_3 is an aliphatic, cycloalkyl or aryl hydrocarbon unsubstituted or substituted with sulfonic acid, ester, halogen, hydroxy, ether or amino;

Z_2 represents Z_1 or hydrogen;

R represents hydrogen and/or an alkyl group of 1 to 4 carbon atoms;

R′ represents an alkyl group of 1 to 8 carbon atoms or an aryl group of up to 10 carbon atoms; and

R″ represents an alkyl or alkoxyalkyl group of 1 to 8 carbon atoms.

B 424,410
PROCESS FOR PRINTING FIBER PRODUCTS OF ACRYLIC FIBER BLENDS

Eichiro Ueno, Wakayama; Hideo Kawasaki, Moriyama, and Shozo Shigita, Hirakata, all of Japan, assignors to American Cyanamid Company, Stamford, Conn.

Filed Dec. 13, 1973, Ser. No. 424,410
Int. Cl.² D06P *3/82*
U.S. Cl. 8—21 A 10 Claims

References Cited
UNITED STATES PATENTS

2,922,690	1/1960	Mueller et al.	8/21 A
3,211,514	10/1965	Casty et al.	8/21 A X
3,708,258	1/1973	vonderEltz et al.	8/21 A
3,843,319	10/1974	vonderEltz et al.	8/21 A

FOREIGN PATENTS OR APPLICATIONS

444,615	2/1969	Japan	8/21 A X

1. A process for dyeing a product of a fiber blend of from about 25 to 75 weight percent of an acrylic fiber substantially free of acid dye sites and, correspondingly from about 75 to 25 weight percent of an acid dyeable fiber, which process

comprises printing said fiber product with a printing paste containing a monosulfonic acid dye having an inorganicity/organicity ratio less than 4 and thereafter steaming the printed fiber product, whereby both components are dyed with said dye.

B 430,213

PREPARING A REACTOR CONTAINING ENZYMES ATTACHED TO DIALDEHYDE CELLULOSE

Bernard S. Wildi, Kirkwood, and Lloyd E. Weeks, Creve Coeur, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 215,432, Jan. 4, 1972, abandoned. This application Jan. 2, 1974, Ser. No. 430,213

Int. Cl.² C07G *7/02*

U.S. Cl. 195—68 **8 Claims**

References Cited

UNITED STATES PATENTS

3,705,084	12/1972	Reynolds	195/63
3,706,633	12/1972	Katchalski et al.	195/63
3,753,861	8/1973	Forgione	195/68

FOREIGN PATENTS OR APPLICATIONS

83,154	7/1971	Germany

OTHER PUBLICATIONS

Weliky et al., The Chemistry and Use of Cellulose Derivatives for the Study of Biological Systems, Immunochemistry, Vol. 2, 1965, (pp. 293–305).

1. A method for producing a biologically active flow-through reactor which comprises the steps of

reacting a liquid permeable fibrous cotton with a periodic acid solution for a time sufficient to oxidize 5 to 80 percent of the glucose units in the cotton to units containing dialdehyde groups;

substantially freeing the fibrous dialdehyde cotton of excess periodic acid;

placing the fibrous dialdehyde cotton in a liquid permeable, flow-through reactor to constitute an elongated reactor core, and

passing a liquid containing an enzyme at a substantially neutral or alkaline pH through the fibrous dialdehyde cotton in the liquid permeable, flow-through reactor to react the enzyme through a primary amino group thereof not essential for biological activity directly with aldehyde groups of the cotton so as to form a carbonnitrogen double bond and thereby binding said enzyme to said core.

B 431,797

CAFFEINE ANTAGONISM

Benjamin Raphael Zeitlin, Suffern; Alan Bryan Pritchard, Hartsdale, both of N.Y., and Harold S. Levenson, Stamford, Conn., assignors to General Foods Corporation, White Plains, N.Y.

Filed Jan. 9, 1974, Ser. No. 431,797

Int. Cl.² A23F *1/04, 1/10*

U.S. Cl. 426—594 **14 Claims**

References Cited

UNITED STATES PATENTS

2,206,319	7/1940	Geitz, Jr.	426/311 X
2,340,989	2/1944	Salkin	426/311 X
2,380,092	7/1945	Weisberg	429/594
3,243,347	3/1966	Kracauer	426/311 X
3,536,494	10/1970	Johnson	426/311
3,579,356	5/1971	Miller et al.	426/177

FOREIGN PATENTS OR APPLICATIONS

190,944	7/1957	Germany

OTHER PUBLICATIONS

"Coffee User's Guide," by M. Sivetz, published by Coffee Publications, Box 455, San Anselmo, Cal., 1963, p. 21.

"Fortification of Foods with Vitamins and Minerals," by A. F. Morgan in Milbank Memorial Fund Quarterly, 1939, Vol. 17, pp. 221–229.

"Modern Drug Encyclopedia," edited by M. Howard, Fourth Edition, Published by Drug Publications Inc., N.Y. 1949.

S. Bellet et al., "The Effect of Nicotinic Acid on the Caffeine Induced Serum Free Fatty acid Increase," The Journal of Pharmacology and Experimental Therapeutics, Vol. 175, pp. 348–351.

"Determination of Nicotinic Acid in Coffee by Paper Chromatography," by Boddeker et al., Analytical Chemistry, Vol. 35, No. 11, Oct. 1963, pp. 1662–1663.

1. A composition for preparing a coffee beverage comprising (a) coffee containing caffeine, said coffee being selected from the group consisting of roasted and ground coffee and soluble coffee solids from roasted coffee, and (b) nicotinic acid or a soluble salt thereof, the amount of nicotinic acid or soluble salt thereof being sufficient to provide from about 6 mg to about 50 mg per cup of coffee beverage prepared from said coffee, wherein a cup of coffee beverage comprises an aqueous solution containing from about 1.5 to 2.0 grams of soluble coffee solids, and the amount of nicotinic acid or soluble salt thereof present in the coffee beverage is effective to at least partially antagonize the sleep disturbing characterictics of the caffeine present in the coffee.

B 441,789

INTERMEDIATE MOISTURE ANIMAL FOOD HAVING IDENTIFIABLE MEAT AND EGG COMPONENTS

Eugene H. Reardanz, and Jerry N. Boudreau, both of Kankakee, Ill., assignors to General Foods Corporation, White Plains, N.Y.

Filed Feb. 12, 1974, Ser. No. 441,789

Int. Cl.² A23K *1/14*; A23L *1/32*

U.S. Cl. 426—332 **9 Claims**

References Cited

UNITED STATES PATENTS

3,073,704	1/1963	Rivoche	426/211
3,202,514	8/1965	Burgess et al.	426/805
3,380,832	4/1968	Bone	426/250
3,482,985	12/1969	Burgess et al.	426/250
3,561,972	2/1971	Dodge et al.	426/129
3,615,652	10/1971	Burgess et al.	426/324
3,793,466	2/1974	Hawkins et al.	426/274
3,808,341	4/1974	Rongey et al.	426/211

1. A process for preparing a shelf-stable, intermediate-moisture meat and egg animal food adapted to be packaged without resort to sterilization or refrigeration, said animal food having a moisture content of from 15 percent to 30 percent

and having a substantially neutral pH of from about 6.0 to 8.0, comprising:

a. forming a mixture of proteinaceous meaty materials and water soluble solutes, principally sugar in an amount sufficient to impart bacteriostasis to said mixture, and heating said mix at a temperature above about 150°F to prepare a first shelf-stable meat component having a moisture content of 15 percent to 30 percent, a pH of from about 6.0 to 8.0, and sugar from 15 percent to 35 percent by weight;

b. extruding the meat component prepared in a) to desired shape;

c. forming a mixture of 5 percent – 45 percent egg on a dry basis, 10 to 40 percent added water, 5 percent – 50 percent vegetable protein, an effective level of an edible binder material, and water soluble solutes, principally sugar in an amount sufficient to impart bacteriostasis to said mixture and heating said mixture at a temperature above about 150°F to prepare a second shelf-stable egg component having a moisture content of 15 percent to 30 percent, a pH of from about 6.0 to 8.0, and sugar from 15 percent to 35 percent by weight;

d. extruding the egg component prepared in c) to desired shape;

e. blending said meat component and said egg component in desired ratios in a manner which avoids a substantial loss of identity of each component; and

f. pressing said mixture of e) whereby the meat and egg components are bound together into a desired shape.

B 444,294

TETRAAZO DIRECT UREA-DERIVED DYE HAVING A CORE OF H-ACID, K-ACID OR S-ACID

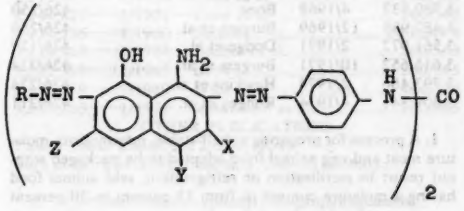
Harvey Irvin Stryker, Carneys Point, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 21, 1974, Ser. No. 444,294
Int. Cl.² C09B *43/14*
U.S. Cl. 260—167 **5 Claims**

References Cited
UNITED STATES PATENTS

2,228,415	1/1941	Sparks et al.	260/167 X
2,264,681	12/1941	Rossander et al.	260/168
2,417,306	3/1947	Krebser et al.	260/168 X
2,842,538	7/1958	Byland	260/168
2,885,391	5/1959	Huss et al.	260/167 X

1. A water-soluble dye of the formula



wherein:

R is selected from unsubstituted phenyl, unsubstituted naphthyl, phenyl substituted with up to 3 substituents and naphthyl substituted with up to 3 substituents, said substituents selected from the group methyl, ethyl, methoxy, ethoxy, sulfonic acid, and chlorotrimethylammonium acetyl, and

X, Y and Z are substituted so as to give derivatives of at least one of 1-amino-8-naphthol-4,6-disulfonic acid, 1-amino-8-naphthol-3,6-disulfonic acid, and 1-amino-8-naphthol-4-sulfonic acid.

B 449,988

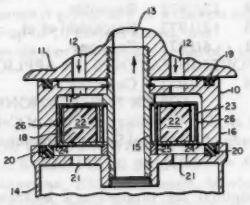
OIL FILTER ADAPTER

William Dein Lewis, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 11, 1974, Ser. No. 449,988
Int. Cl.² B01D *35/00*; C10M *7/02*
U.S. Cl. 210—199 **4 Claims**

References Cited
UNITED STATES PATENTS

2,580,856	1/1952	Smith et al.	23/267 D
2,627,977	2/1953	Kent	23/267 D
3,507,932	4/1970	Morduchowitz et al.	252/56 R X
3,630,905	12/1971	Sorgo	252/59 X
3,634,249	1/1972	Dupas et al.	252/59
3,687,849	8/1972	Abbott	252/56 R X
3,715,037	2/1973	Shin-En Hu et al.	210/501
3,749,247	7/1973	Rohde	210/501 X
3,772,196	11/1973	St. Clair et al.	252/56 R X



1. In combination with an oil filter, for use with an internal combustion engine using circulating oil, the improvement comprising an oil filter adapter, coaxial with and adjoining the oil filter, placed between the oil filter and the engine, said adapter comprising a casing having at least one opening to permit flow of oil from said engine to said adapter and at least one opening to permit flow of oil from said adapter to said filter and disposed in said casing in the path of the flowing oil and oil-soluble, solid oil viscosity index modifier and means in association with said modifier to limit contact of the surface of the modifier with the flowing oil wherein the solid copolymer is toroidal in shape and is encased in a perforated, oil insoluble metal shield.

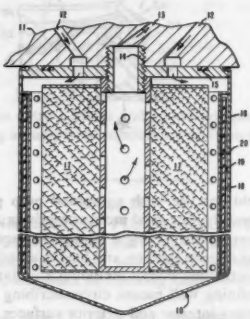
B 449,989
OIL FILTER

Lester Samuel Cohen, Broomall, Pa., and William Dein Lewis, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 11, 1974, Ser. No. 449,989
Int. Cl.[2] B01D *11/00*
U.S. Cl. 210—168 1 Claim

References Cited
UNITED STATES PATENTS

1,245,626	11/1917	Shaffer	23/267 D
3,231,324	1/1966	Young	210/502 X
3,336,223	8/1967	Kneeland	210/506 X
3,343,918	9/1967	Moulder	23/267 D
3,687,849	8/1972	Abbott	252/56 R X
3,772,193	11/1973	Nelli et al.	210/205 X



1. In an oil filter, for use with an internal combustion engine using circulating lubricating oil, having an outer casing and a filter element disposed in said casing to provide an annular passage around said element the improvement comprising:
   1. a sheet of an oil-soluble, solid ethylene copolymer comprising about 25 to 55% by weight ethylene, 35 to 75% by weight propylene and up to 10% by weight of 1,4-hexadiene lining the inner side walls of said casing and
   2. a perforated metal sheet overlaying the copolymer sheet, said perforations of a size to limit contact of the copolymer sheet with the circulating oil over its normal life.

B 452,293
PRODUCTION OF GLASS FIBER PRODUCTS

Harland E. Fargo, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Mar. 18, 1974, Ser. No. 452,293
Int. Cl.[2] B32B *17/04, 27/42*
U.S. Cl. 156—167 6 Claims

References Cited
UNITED STATES PATENTS

3,167,468	1/1965	Lovelace et al.	428/378
3,481,771	12/1969	Doering	117/126 GQ
3,616,181	10/1971	Stalego	117/126 GB
3,684,467	8/1972	Smucker	65/3
3,689,300	9/1972	Bunger et al.	117/126 GQ
3,705,073	12/1972	Marzocchi et al.	161/198
3,705,075	12/1972	Marzocchi	161/193
3,793,310	2/1974	Elizer	117/126 GQ
3,823,103	7/1974	Harding	260/17.2

1. A method of preparing a bonded glass fiber product comprising the steps of:
   a. forming glass fibers from molten streams of glass;
   b. combining the glass fibers with a heat curable aqueous binder composition comprising
      1. 60–95 percent by weight of a complex polymeric component formed from a reaction mixture consisting of phenol, formaldehyde, a modifier selected from the group consisting of starch and compounds which are degradation products of starch, and urea, wherein said polymeric component is produced by:
         a. charging a reactor with a mixture of formaldehyde and phenol in a mole ratio of formaldehyde/phenol of from 2.9–4.2/1;
         b. reacting the mixture in the presence of a condensing agent until it has a free formaldehyde content of from 7–15 percent of the total weight of formaldehyde, phenol and water;
         c. adding to the reactor the starch or starch decomposition product in an amount ranging from 5 to 50 percent of the phenol charged; and
         d. cooling the reactor contents;
      2. 10–80 percent of urea, based upon the weight of the phenol originally charged to produce the polymeric component, with the proviso that at least 5 percent of urea, based upon the weight of the phenol originally charged to produce the polymeric component is dissolved in the polymeric component for at least fifteen minutes at a temperature of at least 90°F.
      3. 0.5–25 percent of a lubricant based upon the total weight of the complex polymeric component and any unreacted urea,
      4. 0.1–1 percent of a silane, based on the total weight of the complex polymeric component and any unreacted urea,
      5. 0.2–3.0 percent of an ammonium salt of a strong acid based on the total weight of the complex polymeric component and any unreacted urea,
      6. water, to dilute the binder to a desired solids content of from 1–40 percent,
   c. consolidating the fibers and heat curable aqueous binder composition into a loosely packed mass on a foraminous conveyor; and
   d. curing the heat curable binder composition in situ on the glass fiber product.

B 459,821
PRODUCTION OF PLASTER FLOORS BY THE FLOODING PROCESS

Friedrich Hinsche, Leverkusen, Kuepperstег, and Kurt Schaupp, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 10, 1974, Ser. No. 459,821
Claims priority, application Germany, Apr. 16, 1973, 2319069
Int. Cl.[2] E04B *5/00*
U.S. Cl. 428—537 7 Claims

References Cited
UNITED STATES PATENTS

825,870	7/1906	Schirra	117/70 R
1,664,638	4/1928	Mitter	52/516 X
2,307,696	1/1943	Blair-McGuffie	117/70 R
2,362,060	11/1944	Etridge et al.	161/209 X
3,389,042	6/1968	Bieri et al.	161/209 X
3,694,298	9/1972	Veschuroff et al.	117/11 X

1. In the process for producing a plaster flooring having a flat and smooth surface by mixing an inorganic binder with water to form a fluid paste and applying said fluid paste to a surface to be covered so that said paste flows freely thereover, the improvements which comprise coating the surface to be covered with a water-absorbent layer prior to application of said fluid paste, said water-absorbent layer comprising at least one material selected from the group consisting of gypsum, natural anhydrite, synthetic anhydrite and cement and being used in 2.5 to 42% by weight of the solids in the fluid paste,

said binder being an anhydrite which has a water-binder factor of about 0.38 to 0.75.

B 461,685
SUBSTITUTED 1,2-DIHYDROPYRIDINES AND PROCESS FOR PREPARING SAME

Reinhard A. Sulzbach, Burghausen, Germany, and Abul F. M. Iqbal, Glattbrugg, Switzerland, assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 153,062, June 11, 1971, Pat. No. 3,816,439. This application Apr. 17, 1974, Ser. No. 461,685

Claims priority, application Switzerland, June 19, 1970, 9393/70

Int. Cl.² C07D *215/58, 211/92*

U.S. Cl. 260—283 CN **5 Claims**

References Cited

UNITED STATES PATENTS

3,816,439 6/1974 Sulzbach et al. ..... 260/295 R

OTHER PUBLICATIONS

Shostrakovskii et al., Chem. Abstr., Vol. 59, 11550e–h, Nov. 1963.

1. Process for the production of 1,4-bis-(trimethylsilyl-2-(1-carbomethoxyethyl)-1,2-dihydropyridine which comprises reacting acrylic acid methyl ester with 1,4-bis-(trimethylsilyl)-1,4-dihydropyridine under anhydrous and nonoxidizing conditions.

5. Process for the production of 1-phenyl-2-(1-cyanoethyl)-1,2-dihydropyridine which comprises reacting acrylonitrile with 1-phenyl-1,4-dihydropyridine under anhydrous and nonoxidizing conditions.

B 463,591
POLYETHYLENE PACKAGING FILM

Richard A. Offermann, Countryside, and Robert J. Vorrier, Palos Hills, both of Ill., assignors to Union Carbide Corporation, New York, N.Y.

Filed Apr. 24, 1974, Ser. No. 463,591

Int. Cl.² B32B *27/32;* **B06D** *3/02*

U.S. Cl. 428—523 **8 Claims**

References Cited

UNITED STATES PATENTS

2,828,237	3/1958	Rosser	154/139
3,013,914	12/1961	Willard	154/43
3,027,343	3/1962	Kane	260/33.6
3,036,930	5/1962	Grimminger et al.	117/93
3,043,716	7/1962	Busse et al.	117/132
3,188,265	6/1965	Charbonneau et al.	161/188
3,277,040	10/1966	Barkis et al.	260/29.6
3,279,940	10/1966	Francis et al.	117/94
3,282,729	11/1966	Richardson et al.	117/138.8
3,442,686	5/1969	Jones	117/70
3,481,891	12/1969	Boylan et al.	260/21
3,629,360	12/1971	Burkhart	260/829
3,639,134	2/1972	Stegmeier et al.	117/7
3,829,324	8/1974	Blais et al.	117/47 A
3,887,579	6/1975	Brunet et al.	264/316

FOREIGN PATENTS OR APPLICATIONS

1,078,813	8/1967	United Kingdom
545,406	8/1957	Canada
812,448	4/1959	United Kingdom

1. A transparent, flexible thermoplastic polyethylene packaging film having a thin transparent coating consisting essentially of a film-forming polyester resin applied to at least a portion of one surface thereof in an amount of at least 0.081 gms. of polyester resin per sq. meter of film and not more than an amount which would affect the transparency and flexibility of said film, said resin coated surface remaining transparent and being readily separable from contiguous surfaces of thermoplastic film after heating at temperatures employed in heat-shrinking thermoplastic film.

B 468,421
MOLD CONSTRUCTION HAVING REMOVABLE BASE MEMBER

Frederick M. Granberg, Knoxville, Tenn., assignor to International Paper Company, New York, N.Y.

Filed May 9, 1974, Ser. No. 468,421

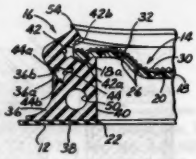
Int. Cl.² B41B *11/60;* **D21J** *7/00*

U.S. Cl. 162—274 **13 Claims**

References Cited

UNITED STATES PATENTS

1,135,381	4/1915	Kenney	249/113 X
2,174,425	9/1939	Schlumbohm	249/112 X
2,971,237	2/1961	Graham	425/DIG. 44
3,802,963	4/1974	Lee et al.	162/228 X
3,838,955	10/1974	Dubbeld	249/113 X



1. A mold for use with a molded pulp product making apparatus and the like, said mold comprising, in combination, base member means having a deposit surface adapted to receive a layer of pulp thereon and having a peripheral marginal edge, support frame means including a unitary resilient body member defining wall means circumscribing said base member and having interior and exterior surfaces, first circumferential groove means formed in the interior surface of said wall means receiving at least a portion of said marginal edge of said base member means in supporting relation, second circumferential continuous groove means of a predetermined transverse cross-sectional configuration formed in said exterior surface of said wall means, and elongated retainer means releasably received within said second groove means and having a length substantially equal to the circumferential length of said second groove means, said body member being made of a material capable of selective manipulation when said retainer means is removed from said second groove means to allow said marginal edge of said base member to be inserted and removed from said first groove means, said body member and said retainer means cooperating to substantially prevent removal of said base member from said first groove means when said retainer means is disposed within said second groove means.

B 476,542
LUBE EXTRACTION WITH NMP/PHENOL/WATER MIXTURES

James D. Bushnell, 312 Timber Drive, Berkeley Heights, N.J. 07922

Continuation-in-part of Ser. No. 311,287, Dec. 1, 1972, abandoned. This application June 5, 1974, Ser. No. 476,542

Int. Cl.² C10G *21/06*

U.S. Cl. 208—323 **20 Claims**

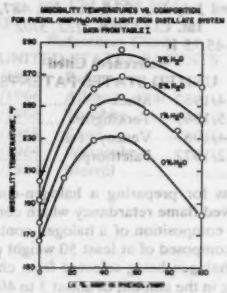
References Cited

UNITED STATES PATENTS

2,754,249	7/1956	Myers et al.	208/323
2,771,494	11/1956	Weedman	208/323
2,902,444	9/1959	Shmidl	208/323
3,415,742	12/1968	Eisenlohr et al.	208/323
3,472,757	10/1969	Morris et al.	208/326
3,476,681	11/1969	Davies et al.	208/326

1. A process for upgrading a lubricating oil stock which comprises:

1. contacting said lubricating oil stock with a solvent comprising n-methyl-2-pyrrolidone and phenol wherein the amount of phenol in said solvent ranges between about 20 and 80 LV% based on the total amount of n-methyl-2-pyrrolidone and phenol in the solvent;



2. forming an extract phase and a raffinate phase; and
3. recovering an upgraded lubricating oil from said raffinate phase.

B 480,287

HYDRATION RESISTANT FUSED DOLOMITIC GRAIN AND PRODUCTION METHOD THEREFOR

Donald L. Guile, Horseheads, and Robert K. Smith, Corning, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed June 17, 1974, Ser. No. 480,287
Int. Cl.² C04B *35/04, 35/62*
U.S. Cl. 106—58 **20 Claims**

References Cited
UNITED STATES PATENTS

3,262,795	7/1966	Davies et al.	106/58
3,332,740	7/1967	Alper et al.	106/58

1. A basic, fused refractory material consisting essentially of, by weight on the oxide basis, 50–67% MgO and 33–50% CaO, and being characterized in at least a surface layer thereof by a fine microcrystalline structure having at least 2.0% MgO in solid solution in the CaO phase.

B 480,591

METHOD OF MAKING EMBOSSABLE MONOLITHIC IDENTIFICATION CREDIT CARD

Leon L. Bildusas, Wheaton, Ill., assignor to General Binding Corporation, Northbrook, Ill.

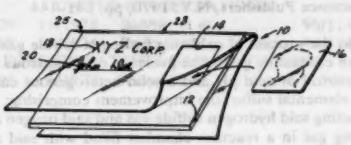
Continuation-in-part of Ser. No. 291,208, Sept. 22, 1972, abandoned. This application June 18, 1974, Ser. No. 480,591
Int. Cl.³ C09J *5/04;* **G09R** *3/02*
U.S. Cl. 156—220 **8 Claims**

References Cited
UNITED STATES PATENTS

3,068,140	12/1962	Biddle	156/227
3,614,839	10/1971	Thomas	40/2.2
3,684,635	8/1972	Stadts	283/7
3,725,184	4/1973	Scopp	156/313

1. A method of making an embossable identification credit card having thereon an over-laminated photograph and signature, said method comprising:

a. providing at least one polyvinyl chloride core;
b. applying a thin layer of a primer comprising an organic solvent soluble copolymer capable of providing a surface for a secure bond under relatively mild laminating conditions between a polyvinyl chloride surface and a plastic material surface to both surfaces of said polyvinyl chloride core;
c. placing a photograph and a signature onto the primed core and placing the primed core, photograph and signature between two clear plastic films having a heat-seal adhesive coating composed of an ethylene-vinyl acetate copolymer on the inner surfaces thereof so as to attain an assembly; and



d. subjecting said assembly to relatively mild laminating conditions comprising a temperature in the range of about 200° to 250° F., a pressure of about 2 lbs. per linear inch width and a period of time ranging from about 2 to 60 seconds so as to laminate said clear plastic films to said polyvinyl chloride core over said photograph and signature thereon whereby a monolithic identification card is produced which can be embossed with stable, raised indicia.

B 480,987

FIBROUS PROTEIN MATERIALS

Myung Ki Kim, Tarrytown, and Joaquin Castro Lugay, Thornwood, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed June 18, 1974, Ser. No. 480,987
Int. Cl.² A23J *3/00*
U.S. Cl. 426—656 **12 Claims**

References Cited
UNITED STATES PATENTS

3,047,395	7/1962	Rusoff et al.	426/104
3,488,770	1/1970	Atkinson	426/104
3,490,914	1/1970	Okumura et al.	426/364
3,801,713	4/1974	Tolstoguzov et al.	426/350 X

1. A method for preparing a texturized protein material comprising:

a. preparing a mixture comprising heat coagulable protein and water;
b. cooling the mixture to freeze the water into elongated ice crystals and to separate the protein into well-defined, well-ordered, substantially independent zones;
c. freeze drying the frozen mass resulting from the operation of step (b); and
d. heating the resulting freeze dried material to coagulate the protein.

12. A texturized protein material having a well-defined, well-ordered structure comprised of substantially independent protein fibers, the material being prepared according to the process of claim 1.

B 481,778
SULFUR RECOVERY SYSTEM

Frederick W. Sanders, Chillicothe, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Continuation of Ser. No. 230,525, Feb. 29, 1972, abandoned. This application June 21, 1974, Ser. No. 481,778

Int. Cl.² C01B 17/04

U.S. Cl. 423—573 G 5 Claims

References Cited

UNITED STATES PATENTS

1,851,312	3/1932	Huff	423/574
1,941,623	1/1934	Rosenstein	423/574 X
3,666,405	5/1972	Winsel	423/212 X

OTHER PUBLICATIONS

Kirk–Othmer; *Encyclopedia of Chem. Tech.*; Vol. 22; 2nd Ed.; Interscience Publishers, N.Y. 1970; pp. 141–144.

1. In the process of oxidizing hydrogen sulfide gas with an oxygen containing gas in the presence of an aqueous medium at a neutral or acid pH and a solid heterogenous catalyst to form elemental sulfur, the improvement comprising:

reacting said hydrogen sulfide gas and said oxygen containing gas in a reaction chamber filled with said aqueous medium and said solid heterogeneous catalyst in particulate form, said solid catalyst being carbon particles which are relatively free from chemical attack by the reactants and the reaction products, said carbon particles having surface portions in contact with a hydrophobic material selected from the group consisting of polystyrene, polytetrafluoroethylene, polyethylene, silicones, polychlorotrifluoroethylene, prepolymerized silicone oils, high vacuum silicone grease, poly (chloro-p-xylylene), paraffin, paratoluene sulfonamide, polydichlorodifluorethylene and octadecyl amine without being completely encapsulated by or encapsulating said hydrophobic material.

B 484,437
SUBSTITUTED FLUOROPHOSPHAZENES

Heinrich Adolphi, Limburgerhof; Gerd Wunsch, Speyer, and Volker Kiener, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed July 1, 1974, Ser. No. 484,437

Int. Cl.² C07C 9/15; A01N 9/36

U.S. Cl. 260—927 N 11 Claims

References Cited

UNITED STATES PATENTS

2,214,769	9/1940	Lipkin	260/927 N

1. A substituted fluorophosphazene of the formula

$$N_3P_3F_nZ_{6-n},$$

where Z denotes OR or SR, wherein R denotes lower alkyl and *n* denotes one of the integers 2, 3, or 4.

B 487,529
PROCESS FOR THE PRODUCTION OF A HALOGEN-CONTAINING ARCYLIC SYNTHETIC FIBER IMPROVED IN FLAME RETARDANCY

Kenji Takeya; Hiroshi Suzuki, and Tadashi Ichimaru, all of Okayama, Japan, assignors to American Cyanamid Company, Stamford, Conn.

Filed July 11, 1974, Ser. No. 487,529

Int. Cl.² C08K 3/22, 5/02

U.S. Cl. 260—45.75 H 8 Claims

References Cited

UNITED STATES PATENTS

2,592,926	4/1952	Mack	260/45.75 K
3,088,932	5/1963	Tarkington	264/182
3,313,768	4/1967	Veazey et al.	260/45.75 K
3,642,628	2/1972	Palethorpe	260/45.75 K

1. A process for preparing a halogen-containing acrylic fiber of improved flame retardancy which comprises: preparing a spinning composition of a halogen-containing acrylonitrile polymer composed of at least 50 weight percent of acrylonitrile, said halogen being selected from chlorine and bromine and being in the amount of about 3 to 40 weight percent based on the weight of said polymer; uniformly dispersing in said spinning composition from about 0.1 to 10 weight percent, based on the weight of said polymer, of a diorganotin oxide compound of the formula

wherein R_1 and R_2 are individually selected from alkyl, alkenyl, aryl, alkaryl, aralkyl, cycloalkyl, and cycloalkenyl groups containing up to about 22 carbon atoms; and spinning the resulting dispersion.

B 490,812
DIAZEPINO(1,2-α)INDOLES

Alan Chapman White, Windsor, and Robin Michael Black, Iver Heath, both of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

Continuation-in-part of Ser. No. 313,232, Dec. 8, 1972, Pat. No. 3,850,957. This application July 22, 1974, Ser. No. 490,812

Claims priority, application United Kingdom, Dec. 14, 1971, 1250/71

Int. Cl.² C07D 243/04

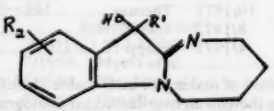
U.S. Cl. 260—326.5 B 5 Claims

References Cited

UNITED STATES PATENTS

3,595,874	7/1971	Hester	260/326.5 B

1. A compound selected from the group consisting of bases having the formula:



and the acid addition salts of said bases with pharmaceutically acceptable acids, wherein R^1 represents a member of the group consisting of phenyl, halophenyl, lower alkyl phenyl, lower alkoxy phenyl, dihalophenyl and trifluoromethylphenyl; and R^2 is halogen or hydrogen.

B 499,370

METHOD FOR MAKING AND SLURRYING WAX BEADS

LaVaun S. Merrill, Jr., Englewood, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Continuation-in-part of Ser. No. 289,918, Sept. 18, 1972, Pat. No. 3,846,279. This application Aug. 21, 1974, Ser. No. 499,370

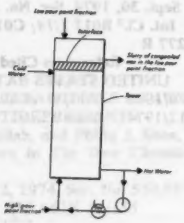
Int. Cl.² F17D 1/16

U.S. Cl. 208—93 31 Claims

References Cited

UNITED STATES PATENTS

2,726,990	12/1955	Baker	208/33
3,234,122	2/1966	Allibone et al.	208/370
3,294,672	12/1966	Torobin	208/33
3,425,429	2/1969	Kane	137/13
3,468,986	9/1969	Watanabe	264/9
3,846,279	11/1974	Merrill	208/93



1. A process for transporting a hydrocarbon mixture as a slurry, the process comprising:

1. fractionating the hydrocarbon mixture into at least a relatively low pour point fraction and a relatively high pour point fraction,
2. introducing at least a portion of the relatively high pour point fraction into the bottom of a tower having a continuous stream of water flowing countercurrent to the introduction of the relatively higher pour point fraction and wherein the water enters the top portion of the tower at a temperature at least about 5°F. below the congelation temperature of the relatively high pour point fraction,
3. dispersing into the water within the tower the high pour point fraction as particles having an average diameter within the range of about 0.05 to about 20 mm, said dispersion being under nonturbulent flow conditions, and permitting the dispersed particles to stay in contact with the water for sufficient time to substantially congeal the particles,
4. passing the resulting congealed particles through an interface, the interface being the juncture between a liquid hydrocarbon comprised of the low pour point fraction introduced into the top of the tower, and the water within the tower,
5. withdrawing at least a portion of the resulting slurry of the congealed particles in the liquid hydrocarbon at about the interface and thereafter transporting the slurry at temperature below those which bring about substantial solution of the congealed particles in the liquid hydrocarbon.

10. The process of claim 1 wherein an equivalent amount of up to about 50% by weight of the high pour point fraction is cracked before it is dispersed into the tower.

B 501,379

ELEMENT COMPRISING A COATING LAYER CONTAINING A MIXTURE OF A CATIONIC PERFLUORINATED ALKYL AND AN ALKYLPHENOXY-POLY(PROPYLENE OXIDE)

John M. Babbitt, E. Rochester, and James F. Houle, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 382,618, July 25, 1973, Pat. No. 3,850,640, which is a continuation-in-part of Ser. No. 230,450, Feb. 29, 1972, Pat. No. 3,775,126. This application Aug. 28, 1974, Ser. No. 501,379

Int. Cl.² G03C 1/76; C09D 3/04

U.S. Cl. 428—412 14 Claims

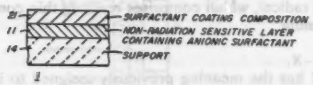
References Cited

UNITED STATES PATENTS

3,775,126	11/1973	Babbitt et al.	96/114.2 X
3,811,889	3/1974	Endou et al.	96/114.2 X

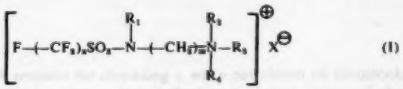
FOREIGN PATENTS OR APPLICATIONS

424,295	6/1972	Australia	96/114.2



1. An element comprising a support, a layer (a) containing at least one anionic surfactant and contiguous to said layer (a) a layer (b) containing a mixture of at least one cationic surfactant and at least one nonionic surfactant, said layer (b) being farther from said support than is said layer (a); said mixture comprising

A. at least one cationic surfactant having the formula (I):

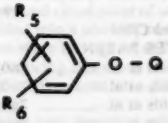


(I)

wherein n is an integer of from 1 to 9, m is an integer of from 1 to 6, R_1 is hydrogen or a lower alkyl group of from 1 to 4 carbon atoms, R_2, R_3 and R_4 are independently selected alkyl groups of from 1 to 6 carbon atoms, and X^- is an anionic moiety; and

B. at least one non-ionic surfactant having the formula (II):

(II)



wherein R_5 is an alkyl group of from 6 to 18 carbon atoms,

R_6 is hydrogen or an alkyl group of from 1 to 18 carbon atoms and Q is a polyether group comprising from about 3 to 15 units of hydroxypropylene oxide, said polyether group comprising n-propylene and isopropylene moieties; the weight ratio of said cationic surfactant to said nonionic surfactant in said mixture being from about 2:1 to about 1:75, respectively.

B 504,582

PROCESS FOR THE MANUFACTURE OF SULPHONIC ACID FLUORIDES

Eric Plattner, Seltisberg, and Christos Comninellis, Prilly, both of Switzerland, assignors to Ciba-Geigy- Corporation, Ardsley, N.Y.

Filed Sept. 9, 1974, Ser. No. 504,582

Claims priority, application Switzerland, Sept. 11, 1973, 13025/73

Int. Cl.² C07C *143/70*

U.S. Cl. 260—543 F **13 Claims**

References Cited

UNITED STATES PATENTS

2,465,951	3/1949	Witte	260/543 R
2,465,952	3/1949	Witte et al.	260/543 R
3,626,004	12/1971	Guertin	260/543 R

FOREIGN PATENTS OR APPLICATIONS

801,037	9/1958	United Kingdom	260/543 R

OTHER PUBLICATIONS

Merck Index, Seventh Edition, (1960), p. 722.

1. A process for the manufacture of sulphonic acid fluorides of the formula

R SO_2F,

wherein R represents a straight-chain or a branched alkyl or cycloalkyl radical, which comprises reacting thio compounds of the formula

R—S—X,

wherein R has the meaning previously assigned to it and X represents hydrogen or the radical —S—R, with nitrogen dioxide or dinitrogen tetroxide in the presence of liquid hydrogen fluoride.

B 505,221

OIL AND WATER REPELLENT POLYMER CONTAINING ONIUM GROUPS

Stanley Temple, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 290,769, Sept. 20, 1972, abandoned. This application Sept. 12, 1974, Ser. No. 505,221

Int. Cl.² C08F *226/02*; C08L *27/12*, *39/00*

U.S. Cl. 260—80.73 **9 Claims**

References Cited

UNITED STATES PATENTS

3,462,296	8/1969	Raynolds et al.	260/29.6 F
3,491,169	1/1970	Raynolds et al.	260/29.6 F
3,645,990	2/1972	Raynolds et al.	260/29.6 F

1. Oil and water repellent solid polymer consisting essentially of, by weight:

a. 20–99% of polymer chain repeat units from a monomer of the formula $R_fCH_2CH_2OCOC(R)=CH_2$ wherein R_f is a perfluoroalkyl group of 4–14 carbon atoms and R is hydrogen or methyl;

b. 1–80% of polymer chain repeat units from a vinyl monomer which has no non-vinylic fluorine atom; and

c. 0.1–4%, based on the combined weights of (a) and (b), of polymer chain repeat units from a monomer of the formula $CH_2=C(R)—Z—Y^+X^-$ wherein R is hydrogen or methyl, Z is a connecting group which activates but does not take part in vinyl polymerization, Y^+ is an onium ionic group which is not sensitive to pH changes and X^- is a water solubilizing anion, the sum of (a) and (b) being 100%.

B 510,682

THERMAL RECOMBINER

James O. Henrie, Hidden Hills, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Division of Ser. No. 340,148, March 12, 1973. This application Sept. 30, 1974, Ser. No. 510,682

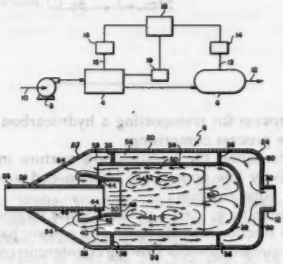
Int. Cl.² B01J *1/14*; C01B *5/00*

U.S. Cl. 23—277 R **3 Claims**

References Cited

UNITED STATES PATENTS

2,203,554	6/1940	Urhi, Jr. et al.	23/277 C
3,853,482	12/1974	Bhan	23/277 C X



1. Apparatus for thermally recombining gases, said apparatus comprising:

a first chamber provided with heating means for initially heating the gases to be combined to a temperature above the threshold for thermal recombination of said gases;

a second chamber comprising:

an outer shell having closed ends,

a generally cup-shaped member mounted coaxially within said outer shell in spaced relation with said outer shell,

gas inlet means positioned to deliver gases into said cup-shaped member and cause mixing of reacted gases in said second chamber with the gases being delivered thereto,

an open-ended shroud encircling said gas inlet means to form a venturi section and provide for mixing a portion of the previously reacted gases with the gases delivered through said gas inlet means, and

gas outlet means communicating with the space between the closed end of said cup-shaped member and the adjacent end of said outer shell for removing reacted gases from said second chamber;

a passageway to provide communication between said first chamber and said second chamber gas inlet means;
a temperature sensing means associated with said second chamber for sensing the temperature therein; and
a temperature control means for controlling said first chamber heating means in response to the temperature sensed in second chamber by said temperature sensing means to substantially maintain a desired temperature in said second chamber.

B 510,957

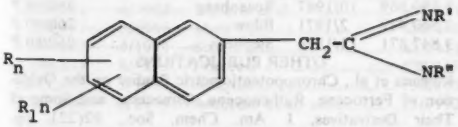
NAPHTHALENE ACETAMIDINES AS ANXIOLYTIC ANTIDEPRESSANTS

Abdulmuniem H. Abdallah, and Philip J. Shea, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 2, 1974, Ser. No. 510,957
Int. Cl.² A61K *31/155*
U.S. Cl. 424—326 11 Claims

References Cited
OTHER PUBLICATIONS
Chemical Abstracts, 71:111086t, (1969).
Chemical Abstracts, 57:4609g, (1962).

1. A method useful for alleviating symptoms of central nervous system depression and anxiety in an animal comprising administering to the animal an amount of a substituted amidine or a pharmacologically-acceptable salt thereof effective to alleviate said symptoms, the substituted amidine corresponding to the formula:



wherein R and R_1 each independently represent halo, lower alkyl or lower alkoxy; n independently in each occurrence represents zero or one; and R′ and R″ each independently represent loweralkyl.

B 516,625

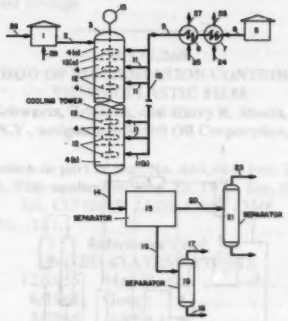
PARTIAL PREDILUTION-DILUTION CHILLING

David A. Gudelis, 1009 Linden Way, and David H. Shaw, 987 Allandale Drive, both of Sarnia, Ontario, Canada

Continuation-in-part of Ser. No. 284,647, Aug. 29, 1972, Pat. No. 3,850,740. This application Oct. 21, 1974, Ser. No. 516,625
Int. Cl.² C10G *43/08*
U.S. Cl. 208—33 7 Claims

References Cited
UNITED STATES PATENTS

2,410,483	11/1946	Dons et al.	208/33
3,642,609	2/1972	Mayer et al.	208/33
3,644,195	2/1972	Gudelis et al.	208/33
3,681,230	8/1972	Eagen et al.	208/33
3,850,740	11/1974	Gudelis et al.	208/33



1. A process for dewaxing a waxy petroleum oil feedstock comprising a waxy, deasphalted and topped crude oil the major portion of which boils above about 650°F. and which contains at least about 10 wt. % of residual material which process comprises:

a. mixing said oil stock with between about 0.3 and 2 volumes of a predilution solvent per volume of said oil stock, thereby depressing the cloud point of said oil stock and forming a first mixture comprising said predilution solvent and said oil stock;
b. introducing said first mixture at a temperature above the depressed cloud point of said oil stock into a cooling zone divided into a plurality of stages and passing said mixture from stage to stage of said cooling zone;
c. introducing dewaxing solvent into at least a portion of said cooling zone at a plurality of spaced points therealong;
d. mixing said dewaxing solvent with at least a portion of said first mixture as it passes from stage to stage of said cooling zone under conditions of high agitation, thereby forming a second mixture comprising said dewaxing solvent, said predilutionsolvent and said oil stock; and
e. cooling said oil stock contained in said second mixture as it passes from stage to stage of said cooling zone, thereby reducing the temperature of said oil stock to below its depressed cloud point and precipitating at least a portion of said wax therefrom under said conditions of high agitation.

B 518,076

MANUFACTURE OF 4,4'-DIPHENYLMETHANE DIISOCYANATE AND A MIXTURE OF DIISOCYANATES AND POLYISOCYANATES

Hans Joachim Pistor, Walldorf; Herwig Hoffmann, Frankenthal; Hans-Ingo Joschek, Mannheim, and Gotthilf Wenner, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Continuation of Ser. No. 2,123, Jan. 12, 1970, abandoned. This application Oct. 25, 1974, Ser. No. 518,076

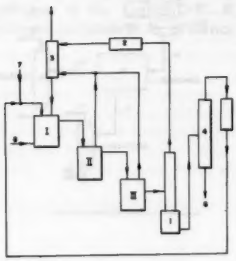
Int. Cl.² C07C *119/02*

U.S. Cl. 260—453 PH **6 Claims**

References Cited

UNITED STATES PATENTS

3,542,871	11/1970	Thompson	260/570



1. A process for the manufacture of 4.4'-diphenylmethane diisocyanate and a mixture of diisocyanates and polyisocyanates which consists essentially of

a. condensing aniline with formaldehyde in a molar ratio of from 2:1 to 6:1 in the presence of a strong aqueous mineral acid at temperatures of 10° to 90°C at the start of the reaction rising to temperatures ranging from 80° to 150°C as condensation proceeds;

b. neutralizing the reaction mixture on completion of condensation;

c. distilling off from the mixture obtained after neutralization all or a portion of the diamines;

d. recovering substantially pure 4,4'-diaminodiphenylmethane from the mixture of separated diamines by crystallization from a solvent;

e. combining the distillation residue from step (c) and the mother liquor from step (d);

f. reacting the substantially pure 4,4'-diaminodiphenylmethane with phosgene to form 4,4'-diphenylmethane diisocyanate; and

g. reacting the mixture from step (e) containing diamines and polyamines with phosgene to form a mixture of diisocyanates and polyisocyanates.

B 519,680

HOT-TINNED WIRE FOR ELECTROTECHNICAL PURPOSES AND METHOD FOR ITS PRODUCTION

Horst Schreiner, Nurnberg, and Dieter Friedrich, Wendelstein, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Oct. 31, 1974, Ser. No. 519,680

Claims priority, application Germany, Nov. 12, 1973, 2356351

Int. Cl.² B32B *15/00*; C23C *1/04*

U.S. Cl. 29—183.5 **5 Claims**

References Cited

UNITED STATES PATENTS

3,573,008	3/1971	Akin, Jr.	29/199
3,579,377	5/1971	Schreiner et al.	117/114 B
3,642,523	2/1972	Schreiner et al.	117/114 B

1. A hot-tinned wire of copper or copper alloys having a two-later coating of tin or tin alloys, wherein the first inner coating is of a thickness between 0.5 and 2 μm and consists of a SnBi alloy containing between 2 and 10 percent by weight of Bi or of a SnNi alloy containing between 0.2 and 1 percent by weight of Ni and a second outer coating of a thickness between 1 and 4 μm consisting of pure tin or a SnPb alloy.

B 522,446

PROCESS FOR POLYMERIZING METALLOCENES

F. Louis Floyd, Strongsville, Ohio, assignor to SCM Corporation, Cleveland, Ohio

Filed Nov. 11, 1974, Ser. No. 522,446

Int. Cl.² C08F *30/04*

U.S. Cl. 260—80 M **5 Claims**

References Cited

UNITED STATES PATENTS

3,063,974	11/1962	Pruett	260/80
3,238,185	3/1966	Neuse	260/80 M
3,350,369	10/1967	Rosenberg	260/80 P
3,560,429	2/1971	Bilow	260/80 P
3,847,871	11/1974	Stephens	260/80 P

OTHER PUBLICATIONS

Kuwana et al., Chronopotentiometric Studies on the Oxidation of Ferrocene, Ruthenocene, Osmocene, and Some of Their Derivatives, J. Am. Chem. Soc., 82(22), pp. 5811–5817, 1960.

1. In a process for the polymerization of a metallocene compound that is polymerizable by free radical polymerization and has a metal nucleus in a state of oxidation below maximum, the improvement for suppressing oxidation of the metal nucleus of said metallocene which comprises:

forming a reaction mixture containing said metallocene and the reducing agent of a redox catalyst combination;

then initiating and maintaining polymerization of said metallocene with the gradual addition of the oxidizing agent of said combination to said reaction mixture.

B 526,942
CATALYTIC PROCESS FOR POLYHYDRIC ALCOHOLS AND DERIVATIVES

James N. Cawse, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Nov. 25, 1974, Ser. No. 526,942
Int. Cl.² C07C *27/06*
U.S. Cl. 260—449 R **19 Claims**

References Cited
UNITED STATES PATENTS

3,081,357	3/1963	Alderson et al.	252/443
3,833,634	9/1974	Pruett et al.	260/449 R

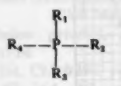
FOREIGN PATENTS OR APPLICATIONS

793,086	6/1973	Belgium	260/449
1,227,144	4/1971	United Kingdom	260/47

OTHER PUBLICATIONS

Martinengo et al., Gazz, 102 (1972), 344–354.

1. A process for the preparation of alkane diols and triols having 2 to 3 carbon atoms in the molecule which comprises reacting a mixture consisting essentially of hydrogen and oxides of carbon in the presence of a rhodium carbonyl complex and a quaternary phosphonium cation of the general formula



wherein R_1, R_2, R_3, and R_4 are alkyl, cycloalkyl, araalkyl, betahydroxy, ethoxymethyl, ethoxyethyl, phenoxyethyl, oleylmethallyl, allyloxyethyl, or a polyalkylene ether group of the formula $(C_nH_{2n}O)_x$-or wherein n has an average value from 1–4, x has an average value from 2 to about 150 and R is hydrogen or alkyl of 1 to about 12 carbon atoms at a pressure of oxides of carbon and hydrogen of from about 1000 psia to about 15,000 psia and a temperature of about 100°C. to about 375°C. sufficient to produce said diols and triols.

B 530,263
SANDWICH WALL GLASS FIBER REINFORCED CONSTRUCTION AND METHOD OF MAKING SAME

Agnar Gilbu, Conroe, Tex., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

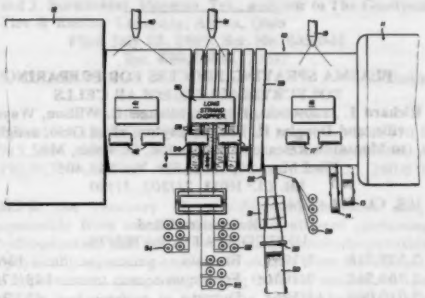
Filed Dec. 6, 1974, Ser. No. 530,263
Int. Cl.² F16L *9/00*
U.S. Cl. 138—177 **12 Claims**

References Cited
UNITED STATES PATENTS

2,644,487	7/1953	Schindler et al.	138/121
2,814,313	11/1957	Tate	138/141
2,913,011	11/1959	Noyes et al.	138/122
3,028,289	4/1962	Roberts et al.	138/121
3,028,291	4/1962	Roberts et al.	138/121
3,237,477	3/1966	Matz	138/140
3,566,607	3/1971	Sixt	138/121
3,598,275	8/1971	Francois	428/113
3,811,478	5/1974	Ahlqvist	156/195
3,821,050	6/1974	Ambrose et al.	156/192

1. In a composite wall structure for fluid retention, the wall structure having spaced, concentric tubular inner and outer shells each formed of glass fiber reinforced resinous polymeric material, the improvement of an intermediate spacing structure interposed between said shells and comprising:

1. generally U-shaped rib forms spaced from each other axially of the shells and each having a bight portion adjacent the outer shell and a pair of spaced, generally parallel leg portions extending from the bight portion toward the inner shell, and
2. ribs interspersed with said rib forms and integrally joining said shells to each other, said ribs each comprising a glass fiber mat covering leg portions of adjacent rib forms, filament-wound glass rovings retaining a mat portion



bridging adjacent rib forms against the inner shell, and resinous polymeric material impregnating both the mat and said rovings.

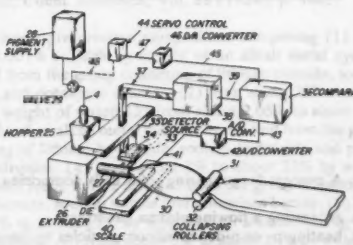
B 535,268
METHOD OF PIGMENTATION CONTROL FOR THERMOPLASTIC FILM

Robert I. Schwartz, Brighton, and Harry R. Sheets, Shortsville, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 444,444, Feb. 21, 1974, abandoned. This application Dec. 23, 1974, Ser. No. 535,268
Int. Cl.² G01D *21/00;* **G06F** *15/46*
U.S. Cl. 235—151.1 **12 Claims**

References Cited
UNITED STATES PATENTS

2,726,922	12/1955	Merrill et al.	425/140
2,988,641	6/1961	Gough	425/140 X
3,122,783	3/1964	Jolliffe et al.	425/141
3,212,127	10/1965	Flook, Jr. et al	425/141
3,286,302	11/1966	Doering	18/2
3,378,676	4/1968	Clement	235/151.3
3,510,374	5/1970	Walker	425/141 X
3,596,071	7/1971	Doering	235/151.3 X
3,737,265	6/1973	Schafer et al.	425/140
3,841,147	10/1974	Coil et al.	235/151.3 X



10. Apparatus for producing pigmented thermoplastic film at a specific predetermined pigment concentration comprising: a radiation thickness gauge including a circuit producing a signal responsive to a measured film thickness; means for weighing said pigmented thermoplastic film including a circuit producing a signal in response to a measured film weight first; logic circuit means for computing the film thickness from said measured film weight, second logic circuit means for comparing said radiation signal and said second logic circuit means signal; and means responsive to said second logic circuit for

adjusting the amount of pigment mixed with said thermoplastic film.

B 561,405

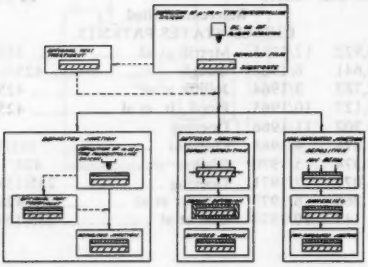
PLASMA SPRAYING PROCESS FOR PREPARING POLYCRYSTALLINE SOLAR CELLS

Richard J. Janowiecki, Dayton; Michael C. Willson, Waynesville, and Douglas H. Harris, Dayton, all of Ohio, assignors to Monsanto Research Corporation, St. Louis, Mo.

Filed Mar. 24, 1975, Ser. No. 561,405
Int. Cl.² H01L *21/203, 31/00*
U.S. Cl. 148—174 **6 Claims**

References Cited
UNITED STATES PATENTS

2,537,255	1/1951	Brattain	136/89
2,763,581	9/1956	Freedman	148/175 X
3,010,009	11/1961	Ducati	427/34 X
3.078,328	2/1963	Jones	136/89
3,160,522	12/1964	Heywang et al.	148/174 X
3,274,007	9/1966	Jones	427/34
3,460,240	8/1969	Tarneja et al.	136/89
3,485,666	12/1969	Sterling et al.	204/192 X
3,496,029	2/1970	King et al.	136/89 X



1. A process for preparing solar cells comprising the steps of:

a. generating a flowing plasma gas stream,
b. heating p- or n-doped silicon particles by injection into said plasma stream,
c. discharging said heated particles from said plasma stream onto a substrate providing a polycrystalline silicon film,
d. during steps (b) and (c) providing a suitable atmosphere surrounding said particles to inhibit oxidation,
e. preparing a p-n junction in said polycrystalline silicon film by diffusion or ion-implantation of a dopant of opposite polarity or type into said film or by forming a layer on said polycrystalline silicon film by plasma spraying doped silicon particles of opposite polarity or type, and
f. providing electrical conductors to control the flow of electricity produced by illuminating said p-n junction.

B 564,255

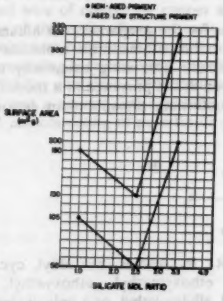
AMORPHOUS PRECIPITATED SILICEOUS PIGMENTS

Satish K. Wason, Churchville, Md., assignor to J. M. Huber Corporation, Locust, N.J.

Continuation-in-part of Ser. No. 519,720, Oct. 31, 1974, which is a continuation-in-part of Ser. No. 286,655, Sept. 6, 1974, Pat. No. 3,893,840. This application Apr. 2, 1975, Ser. No. 564,255
Int. Cl.² C09C *1/30*
U.S. Cl. 106—288 **2 Claims**

References Cited
UNITED STATES PATENTS

3,235,331	2/1966	Nauroth	423/339
3,503,707	3/1970	Burke, Jr.	106/288 B
3,582,379	6/1971	Hackbarth	106/288 B
3,730,749	5/1973	Morgan	106/288 B



1. A new composition of matter comprising an amorphous, finely divided precipitated silica pigment having a wet cake moisture content of less than 70 percent; an oil absorption on the order of less than 125 cc/100 gm; pack densities of greater than 12 pounds/cu. ft.; a valley abrasion of greater than 5.0 mg. wire loss; a surface area in the range of from 100 to 300 m^2/gm; and a refractive index of greater than 1.445, said silica having intimately admixed and associated therewith a metal cation selected from the group consisting of aluminum, magnesium, calcium and zinc, said cation being present in an amount of up to 10 percent by weight based on the total weight of said silica and serving to control the refractive index such that same is greater than 1.445 and serving to control the surface area such that same is in the range of from about 100 to 300 m^2/gm.

B 568,405

2- 3-[4-AZATRICYCLO(4.3.1.1³,⁸)-UNDECAN-4-YL]1,1-DIPHENYLPROPYL -5-METHYL-1,3,4-OXADIAZOLE AND CONGENERS

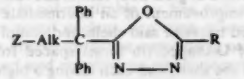
Gilbert W. Adelstein, Evanston, and H. William Sause, Deerfield, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Apr. 16, 1975, Ser. No. 568,405
Int. Cl.² C07D *271/10*
U.S. Cl. 260—307 G **3 Claims**

References Cited
UNITED STATES PATENTS

3,444,180	5/1969	Maeder et al.	260/307

1. A compound of the formula



wherein R represents hydrogen or lower alkyl, Ph represents phenyl, Alk represents alkylene containing more than 1 and fewer than 4 carbons, and Z represents 4-azatricyclo[4.3.1.1³,⁸]undecan-4-yl.

B 573,991

2,5-DIISOPROPYLTEREPHTHALONITRILE

Elmore Louis Martin, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 241,850, April 6, 1972, abandoned, which is a continuation-in-part of Ser. No. 153,428, June 15, 1971, abandoned. This application May 2, 1975, Ser. No. 573,991

Int. Cl.² C07C *121/58*

U.S. Cl. 260—465 H 1 Claim

References Cited

UNITED STATES PATENTS

3,290,353	12/1966	Battershell et al.	260/465

1. 2,5-Diisopropylterephthalonitrile.

B 579,153

PROCESS FOR THE EXTRUSION OF A PLASTIC FOIL HAVING SMALL VARIATIONS IN THICKNESS

Hans Brinkmann; Gottfried Eisele; Helmut Gormar, all of Troisdorf; Horst Pabst, Bonn-Beuel; Helmut Putz, Troisdorf; Hans Jurgen Schrick, Troisdorf, and Uwe Sommermeyer, Troisdorf, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed May 20, 1975, Ser. No. 579,153

Claims priority, application Germany, June 1, 1974, 2426714

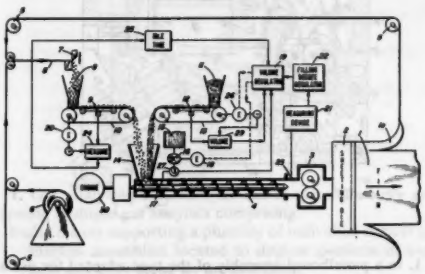
Int. Cl.² B29C *17/08, 29/00;* B29D *7/02;* B29F *3/00*

U.S. Cl. 264—37 14 Claims

References Cited

UNITED STATES PATENTS

3,150,213	9/1964	Doering	264/40
3,391,232	7/1968	Jackson	264/40
3,822,867	7/1974	Evans	259/191



1. A process for extruding a film from materials including virgin polymer and returned scrap, said film having small variations in thickness, comprising:

feeding virgin polymer to an extruder screw inlet and measuring the feed rate thereof;

moving said virgin polymer and returned scrap through an extruder screw press and then moving said materials at a constant rate from the screw press and through a pump having a constant volume output per unit of time;

then extruding said materials through a sheeting die, forming film;

severing margins of said film and recycling the severed margins as scrap to said screw inlet;

measuring the weight per unit time of recycled material returned to said screw inlet;

subtracting the measured quantity of said severed margins from a nominal feed rate for said extruder and controlling the rate at which virgin polymer is fed according to differences between the amount of scrap returned and the nominal feed rate; and

maintaining the pressure constant at an inlet to said constant volume pump.

B 845,044

PURIFICATION OF DIALKYLBENZENE DIHYDROPEROXIDE

Ward J. Burkholder, Houston, Tex., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed July 25, 1969, Ser. No. 845,044

Int. Cl.² C07C *179/02*

U.S. Cl. 260—610 A 2 Claims

References Cited

UNITED STATES PATENTS

2,715,646	12/1959	Hawkins et al.	260/610 B
2,915,557	8/1955	Kreps et al.	260/610 A
3,190,923	6/1965	Sodomann et al.	260/610

1. In the recovery of para-diisopropylbenzene dihydroperoxide from an oxidation reactor effluent containing dihydroperoxide and the corresponding monohydroperoxide by physically separating crude solid oxidate from the effluent, the improvement comprising mixing the solid oxidate with an aromatic hydrocarbon in which the monohydroperoxide is soluble and dihydroperoxide is essentially insoluble at temperatures befow about 30°C, said hydrocarbon being selected from the class consisting of benzene, toluene, xylene, and para-dialkylbenzenes, in a weight ratio of between about 2:1 and 1:5 respectively, maintaining the resulting mixture at a temperature of between about 55°C and the boiling point of said hydrocarbon with sufficient agitation to form a slurry, cooling the slurried mixture to a temperature below about 30°C and recovering the dihydroperoxide.

B 848,336

WOOD PRESERVATIVE CONTAINING ALKALI METAL CYANIDES

Robert E. Stutz, Los Altos Hills, Calif., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 631,595, April 18, 1967, abandoned. This application Aug. 7, 1969, Ser. No. 848,336

Int. Cl.² A01N *11/00*

U.S. Cl. 424—129 8 Claims

References Cited

UNITED STATES PATENTS

3,105,773	10/1963	Frank et al.	428/290
3,305,298	2/1967	Chapman et al.	424/148
3,305,442	2/1967	Nishimoto et al.	424/288

FOREIGN PATENTS OR APPLICATIONS

519,766	12/1955	Canada	167/38.5

OTHER PUBLICATIONS

Dessy, G., Chem. Abstracts, Vol. 18 (1924), p. 3403.

1. A wood preservative composition comprising (1) from about 0.001% to 40% by weight of an alkali metal cyanide selected from the group consisting of lithium cyanide, sodium cyanide and potassium cyanide; (2) from about 20% to about 90% by weight of water; (3) from about 0.05% to about 18% by weight of an alkali metal hydroxide selected from the group consisting of lithium hydroxide, sodium hydroxide and potassium hydroxide; (4) from about 1% to about 22% by weight of an alkali metal borate selected from the group consisting of lithium borate, sodium borate and potassium borate; (5) from about 3% to about 15% by weight of an alkanol having from 1 to 4 carbons; (6) from about 3% to about 20% by weight of an organic solvent selected from the group consisting of acetone, methylethyl ketone, ethylene glycol, propylene glycol, glycerol, di-propylene glycol, tri-propylene glycol, ethylene glycol methyl ether, di-ethylene glycol methyl ether, propylene glycol methyl ether and di-propylene glycol methyl ether; (7) from about 5% to about 40% by weight of a halogenated phenol and (8) from about 0.005% to about 5% by weight of a heavy metal salt or oxide selected from the group consisting of inorganic and organic salts of mercury, lead, tin, copper, zinc, cadmium, arsenic, antimony and silver, and oxides of mercury, lead, tin, copper, zinc, cadmium, arsenic, antimony and silver.

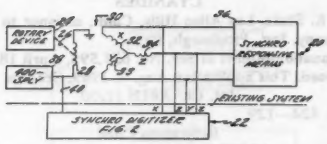
B 270,351
SYNCHRO DIGITIZER

John E. Games, Granby; Henry E. Martin, Wapping, and Kirk S. Walworth, Rockville, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 95,167, Dec. 4, 1970. This application July 10, 1972, Ser. No. 270,351
Int. Cl.[2] H03K *13/02*; H03D *3/04*
U.S. Cl. 340—347 SY 6 Claims

References Cited
UNITED STATES PATENTS

3,258,698	6/1966	Asher	340/347 SY
3,438,026	4/1969	Prill	340/347 SY
3,460,130	8/1969	Lavin	340/347 SY
3,490,016	1/1970	Taylor	340/347 SY
3,505,669	4/1970	Welch	340/347 SY
3,676,659	7/1972	Asmussen	340/347 SY



1. A shaft angle encoder comprising:
means including a reference voltage source, for providing differential signals together indicative of mechanical shaft angle;
circuit means connected for response to the signal outputs of said signals providing means for providing a pair of advance signals relating to an angle in advance of the shaft angle;
and RC/CR bridge responsive to said advance signals for providing output signals, the electrical phase difference of which is equal to twice the shaft angle;
means providing an output manifestation of the outputs of said bridge; and
means concurrently responsive to said bridge outputs, at least one advance signal, and to said reference voltage source, for providing an output manifestation having two different states respectively representing outputs of said bridge corresponding to shaft angles of between 0° and 180° and outputs of said bridge corresponding to shaft angles of between 180° and 360°.

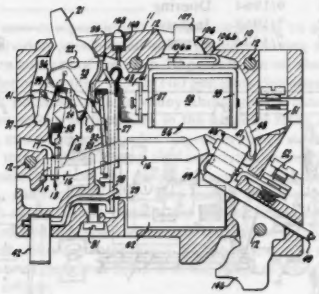
B 340,170
ELECTRIC CIRCUIT BREAKER WITH GROUND FAULT PROTECTION

Ellwood S. Douglas; Richard C. Doyle, both of Orinda; David William Nestor, Oroville, and Wallace W. Wahlgren, Oakland, all of Calif., assignors to The Rucker Company, Oakland, Calif.

Continuation-in-part of Ser. No. 141,298, May 7, 1971, which is a continuation-in-part of Ser. No. 35,993, May 11, 1970. This application Mar. 12, 1973, Ser. No. 340,170
Int. Cl.[2] H02H *3/28*
U.S. Cl. 317—18 D 14 Claims

References Cited
UNITED STATES PATENTS

2,925,559	2/1960	De Sautels	330/23
3,041,544	6/1962	Lindsay	330/25
3,105,198	9/1963	Higginbotham	330/23
3,213,321	10/1965	Dalziel	317/18
3,264,571	8/1966	Meindl et al.	330/23
3,403,301	9/1968	Mrowka et al.	317/119
3,407,337	10/1968	Benham	317/18
3,431,469	3/1969	Stanback	317/119
3,440,580	4/1969	Molenaar	335/18
3,486,140	12/1969	Harper	335/168
3,506,906	4/1970	Nestor	317/18 D
3,539,867	11/1970	Edmunds	317/18
3,555,359	1/1971	Morris et al.	317/18
3,566,189	2/1971	Wilson et al.	317/18
3,611,035	10/1971	Douglas	317/18 D



1. In a panelboard assembly of the type adapted for use at the electrical service entrance of a building for distributing current from the main lines feeding the building to a plurality of branch circuits, said main lines and said branch conductors each including line and neutral conductors, the neutral conductor of the main lines being connected to ground at its source end, said panelboard assembly comprising: a housing, an electrically conductive bus bar member within said housing and adapted for connection to one of the main lines, a plurality of plug-in type circuit breakers disposed side by side in said housing, each of said circuit breakers having an electrically conductive terminal releasably engaging the bus bar member and holding the breaker in a predetermined position in said housing, each of said breakers also having means for connection to the conductors of a separate branch circuit, said circuit breakers each having a set of contacts adapted for interrupting the flow of current to the branch circuit connected thereto when said current exceeds a predetermined level, at least one of said circuit breakers also having highly sensitive ground fault responsive means connected to the contacts therein for interrupting the flow of current to the branch circuit connected to said breaker in response to a ground fault current in said branch circuit, the breaker with ground fault responsive

means, also including means for producing an additional current in the neutral conductor of the branch circuit associated therewith in the event that said conductor is grounded, said additional current being of substantially higher frequency than the current in the main lines, said breaker with ground fault protection being of a size and construction so that it is interchangeable with and can fit in the same space as a conventional circuit breaker without ground fault protection.

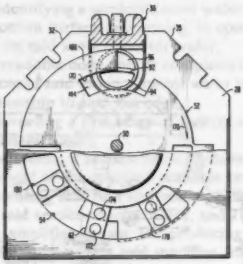
B 374,553
GAS ANALYZING

Ojars Risgin, Grass Lake, and Charles B. Arnold, Saline, both of Mich., assignors to Sensors, Inc., Ann Arbor, Mich.

Filed June 28, 1973, Ser. No. 374,553
Int. Cl.² G01N *21/00*
U.S. Cl. 250—345 **18 Claims**

References Cited
UNITED STATES PATENTS

2,904,687	9/1959	Sobcov et al.	250/343
2,938,118	5/1960	Martin	250/345
3,162,761	12/1964	Luft	250/344
3,498,132	3/1970	Smith et al.	250/343
3,562,524	2/1971	Moore	250/343
3,569,696	3/1971	Karlson	250/344
3,659,941	5/1972	Tong	250/344
3,678,262	7/1972	Herrmann	250/343
3,678,269	7/1972	Malek	250/343



1. Gas analyzing structure for use in simultaneously performing multiple gas anaylses comprising

frame means supporting a plurality of individual optical gas anaylsis assemblies located to dispose portions of each such assembly along an arcuate path,

each such assembly of said plurality of assemblies including a single source of radiant energy, a single radiant energy detector having an electrical output, means for directing the radiant energy from the single source for passage along a sample gas and a reference gas path, and means for directing such radiant energy after passage along the reference gas and sample gas paths to the single detector for such radiant energy,

means for predetermined cyclic interruption of radiant energy in the sample and reference gas paths of each such assembly including a single chopper disc rotatable about a fixed central axis located in predetermined positional relationship to the arcuate path disposition of gas analysis assemblies,

the chopper disc including a plurality of windows predeterminedly spaced radially from the fixed central axis with a portion of the windows being spaced from the central axis a predetermined distance to permit passage of radiant energy in the sample gas path and a portion of the windows being spaced radially from the central axis to permit passage of radiant energy in the reference gas path of each optical gas analyzer assembly upon rotation of the chopper disc about the fixed central axis, and

said radiant energy detector of each of said assemblies being adapted to be connected to circuitry for processing the electrical output of a detector.

B 376,749
LIQUID ELECTROPHOTOGRAPHIC DEVELOPERS

Yvan Karel Gilliams, Berchem; Jozef Leonard Van Engeland, St. Katelijne-Waver, and Noel Jozef De Volder, Edegem, all of Belgium, assignors to AGFA-GEVAERT, N.V., Mortsel, Belgium

Filed July 5, 1973, Ser. No. 376,749
Claims priority, application United Kingdom, July 12, 1972, 32656/72
Int. Cl.² G03G *9/00*
U.S. Cl. 252—62.1 L **14 Claims**

References Cited
UNITED STATES PATENTS

2,877,133	3/1959	Mayer	252/62.1 L X
3,084,043	5/1963	Gundlach	252/62.1 L X
3,301,675	1/1967	Fauser et al.	252/62.1 L X
3,383,209	5/1968	Cassiers et al.	252/62.1 L X
3,542,681	11/1970	Mutaffis	252/62.1 L X

1. A liquid toner composition for the development of electrostatic charge patterns comprising an electrically insulating carrier liquid having a volume resistivity of at least 10^9 Ohm.cm and a dielectric constant below 3, and a pigment or colouring agent suspended in the said carrier liquid, wherein the said liquid composition comprises dissolved in the carrier liquid(1) a bivalent or trivalent metal salt of an oxyacid derived from phosphorus containing at least one organic residue and (2) one or more members selected from the group consisting of amines, polyurethans and alkylated polymers of a heterocyclic N-vinyl monomer.

B 452,915
NEEDLE POSITION DETECTOR FOR INDUSTRIAL TYPE SEWING MACHINES

Takashi Dohi; Kenichi Ohara, and Iwao Gotoh, all of Kadoma, Japan, assignors to Matsushita Electric Industrial Company, Limited, Japan

Filed Mar. 20, 1974, Ser. No. 452,915
Claims priority, application Japan, Mar. 23, 1973, 48-33141
Int. Cl.² G05G *5/00*; H02P *3/06*; D05B *69/22*
U.S. Cl. 318—467 **9 Claims**

References Cited
UNITED STATES PATENTS

3,187,701	6/1965	Heit et al.	112/219 A
3,482,538	12/1969	Hayashi et al.	112/219 A
3,532,953	10/1970	Daab et al.	318/467
3,573,581	4/1971	Dutko et al.	318/266
3,622,854	11/1971	Imai et al.	112/219 A X
3,659,172	4/1972	Kuniaki et al.	318/467
3,738,297	6/1973	Sangiorgi	112/219 A
3,757,232	9/1973	Matuda	318/467 X
3,761,790	9/1973	Daab	318/467
3,763,803	10/1973	Matsuda	112/219 A
3,804,043	4/1974	Benson et al.	112/219 A

1. A needle position detector for a sewing maching having a motor drivable at high and low speeds, a needle armshaft adapted to be driven selectively by said motor to cause the needle to move reciprocally between upper and lower dead points, comprising in combination:

a light source and a circuit including a single photoelectrical device disposed in opposed relation to said light source to receive a light beam therefrom;

a disc coaxially connected to said needle armshaft for rotation therewith in synchronism with the reciprocal movement of said needle;

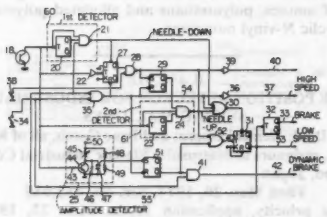
said disc being disposed between said photoelectrical device and said light source and having cutaway portions permit-

ting passage of said light beam from said light source to said photoelectrical device and intervening portions interrupting said light beam, with transition portions between said cutaway portions and said intervening portions passing between said light source and said photoelectrical device as said disc rotates to produce electrical signals in said circuit, said transition portions comprising a first transition portion disposed in predetermined angular relationship to said needle armshaft corresponding to the lower dead point to produce a first signal and an angularly spaced second transition portion disposed in predetermined angular relation to said needle armshaft corresponding to the upper dead point to produce a second signal;

first brake means for decelerating said motor to said low speed;

a needle-down switch for energizing said first brake means;

speed sensing means for detecting when said motor has decelerated to said low speed to deenergize said first brake means;



a needle-down position detector coupled to said speed sensing means and to said photoelectrical device to produce a needle-down position signal in response to said first signal;

second brake means responsive to said needle-down position signal for decelerating said motor to a standstill with the needle at the lower dead point;

memory means coupled to said needle-down position detector to receive said needle-down position signal;

a needle-up switch for operating said motor at said low speed; and

a needle-up position detector coupled to said needle-up switch, said memory means and said photoelectrical device to produce a needle-up position signal in response to said second signal;

said second brake means being receptive of said needle-up position signal to decelerate said motor to a standstill with the needle at said upper dead point.

B 475,801

DRIVING SYSTEM FOR MOVING PATHS OR ESCALATORS

Nobuo Mitsui; Akinori Watanabe; Takeshi Oohira; Kazuhiko Kawauchi, all of Katsuta; Shoichi Nakao, Mito, and Katsuya Teranishi, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed June 3, 1974, Ser. No. 475,801

Claims priority, application Japan, June 4, 1973, 48-61894

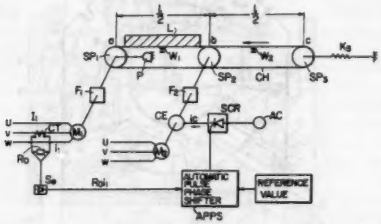
Int. Cl.² H02P 7/00

U.S. Cl. 318—98 **10 Claims**

References Cited

UNITED STATES PATENTS

1,871,696	8/1932	Jackson	318/39
2,411,162	11/1946	King	318/39
2,727,694	12/1955	Helmick, Jr. et al.	318/39 X
2,864,040	12/1958	Trotsky	318/99 X
3,076,906	2/1963	Simo	318/85 X
3,265,947	8/1966	Woehler	318/85 X
3,305,765	2/1967	Rittner	318/39 X
3,353,384	11/1967	Kain et al.	318/99 X
3,364,404	1/1968	Carlson	318/85 X
3,845,366	10/1974	Metzler et al.	318/99



1. A driving system for moving paths or escalators which use an endless chain adapted to be circulated between a path for transporting passengers, comprising:

a first and a second sprocket disposed at one end portion and substantially middle portion of said path, respectively;

a first motor for driving said first sprocket;

a second motor for driving said second sprocket;

means for detecting a quantity corresponding to a loaded weight acting upon said endless chain;

means for setting a reference value; and

means for controlling a torque to be applied upon said second sprocket in response to an output from said detecting means, said torque controlling means including means for increasing the torque to be applied upon said second sprocket in response to an excess developed when the output of said detecting means exceeds said reference value.

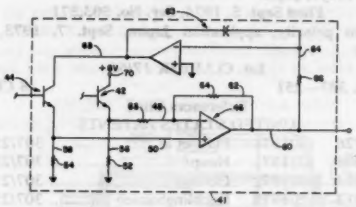
B 477,892
SEMICONDUCTOR WAFER HAVING MACHINE READABLE INDICIES

Kenneth Earl Roehrman, Litchfield Park, and Bernardus I. C. F. van Pul, Phoenix, both of Ariz., assignors to Motorola, Inc., Phoenix, Ariz.

Filed June 10, 1974, Ser. No. 477,892
Int. Cl.² G06K 7/10; G08C 9/06
U.S. Cl. 235—61.11 E **14 Claims**

References Cited
UNITED STATES PATENTS

2,952,008	9/1960	Mitchell et al.	235/61.12 M
3,609,306	9/1971	Langley	235/61.11 E
3,673,389	6/1972	Kapsambelis et al.	235/61.12 N
3,761,725	9/1973	Meyer	235/61.11 E



1. Means for identifying a semiconductor wafer having a top surface and a bottom surface comprising, in combination:
   a. a flat edge on said semiconductor wafer,
   b. a machine readable code and its complement positioned on the bottom of said semiconductor wafer in a predetermined relationship to said flat edge,
   c. means for directing a first beam of radiant energy at the machine readable code,
   d. means for directing a second beam of radiant energy at the complement of the machine readable code,
   e. means for sensing said first and second beams after impinging on said semiconductor wafer, and
   f. differential amplifier means for producing a series of output pulses representing said machine readable code, the outputs from said sensing means constituting the inputs to said differential amplifier.

B 478,234
SYNCHRONIZATION METHOD FOR THE RECOVERY OF BINARY SIGNALS

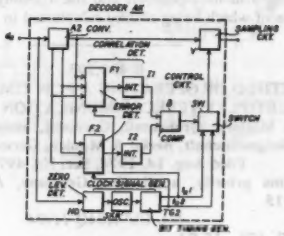
Kurt Bertil Reinhold Lind, Vastra Frolunda, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Division of Ser. No. 308,810, Nov. 22, 1972, Pat. No. 3,838,214. This application June 11, 1974, Ser. No. 478,234
Claims priority, application Sweden, Dec. 6, 1971, 15633/71
Int. Cl.² H04L 7/02; H03K 13/24
U.S. Cl. 325—38 A **6 Claims**

References Cited
UNITED STATES PATENTS

3,303,284	2/1967	Lender	178/68
3,369,229	2/1968	Dorros	340/347
3,515,991	6/1970	Lender	325/38
3,601,702	8/1971	Lender	325/38 A
3,654,492	4/1972	Clark	307/269
3,679,977	7/1972	Howson	325/42
3,707,683	12/1972	Dotter, Jr.	328/139
3,750,021	7/1973	Lender	325/38 A
3,753,113	8/1973	Maruta et al.	325/38 A
3,761,818	9/1973	Tazaki et al.	325/38 A

1. In an information transmission system having a transmitter side wherein a first binary signal representing information bits is converted to a multilevel signal representing the same information bits such that the instantaneous level of the multilevel signal is correlated to the first binary signal and a receiver side wherein the multilevel signal is converted to a received binary-signal conforming with the first binary signal, a method for recovering, at the receiver side, bit timing information during the transmission of signals in the system comprising the steps of:
   a. forming a plurality of series of clock signals by the detection of the instants at which the multilevel signal attains and/or leaves at least one specific signal level, each of said clock signals being phase locked to the received multilevel signal at a different one of a plurality of alternative relative phase positions with respect to the multilevel signal but with only one of such positions being correct;
   b. converting the multilevel signal to a plurality of intermediate binary signals;
   c. generating from the intermediate binary signals pluralities of further binary signals logically related to the levels of the multilevel signal, each of the pluralities being generated at times determined by different ones of the series of clock signals;



   d. temporarily storing the pluralities of further binary signals whereby, at later times, signals related to certain levels of the multilevel signal are available;
   e. correlating to determine at times established by each of the series of clock signals whether a particular relationship exists between the intermediate binary signals and a specific combination of preceding values of the multilevel signal as represented by each of the pluralities of further binary signals associated with each of the series of clock signals respectively, said particular relationship being determined by the correlation between the multilevel signal and the first binary signal at the transmitter side; and
   f. selecting one of the series of clock signals for establishing the bit timing relationship on the receiver side because of the correctness of its phase relation with respect to the information bits of the multilevel signal, said one of the series of clock signals being that which results, over a period of time, in the greatest number of agreements with respect to said particular relationship between said specific combination and the intermediate signals.

B 481,190

METHOD OF HARDENING A PROTEIN-CONTAINING LAYER OF A SILVER HALIDE PHOTOGRAPHIC MATERIAL WITH AN ALKYL ESTER OF 1,2-DIHYDROQUINOLINE-N-CARBOXYLIC ACID

Peter Bergthaller, Cologne; Wolfgang Himmelmann, Opladen, and Karl-Wilhelm Schranz, Odenthal-Hahnenberg, all of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed June 20, 1974, Ser. No. 481,190

Claims priority, application Germany, June 26, 1973, 2332317

Int. Cl.² G03C 1/30

U.S. Cl. 96—50 PT 11 Claims

References Cited

UNITED STATES PATENTS

3,389,142	6/1968	Weinberg	260/287
3,452,140	6/1969	Weinberg	424/258

1. The method of hardening a light sensitive silver halide material having at least one layer which contains at least in part a protein-containing hydrophilic binder by contacting the protein-containing hydrophilic binder with an effective amount of a hardening compound to cause a crosslinking reaction of the protein molecules in the binder the improvement according to which the hardening compound is an alkyl ester of carboxylic acid selected of 1,2-dihydroquinoline-N-carboxylic acid and 1,2-dihydroisoquinoline-N-carboxylic acid, the 1,2-dihydroquinoline nucleus of which being alkoxy substituted in its 2-position and the 1,2-dihydroisoquinoline nucleus of which being alkoxy substituted in its 1-position.

B 497,293

METHOD OF OPERATING A PCM TIME-DIVISION MULTIPLEX TELECOMMUNICATION NETWORK

Alfred Mattern, Grobenzell, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Aug. 14, 1974, Ser. No. 497,293

Claims priority, application Germany, Aug. 14, 1973, 2341115

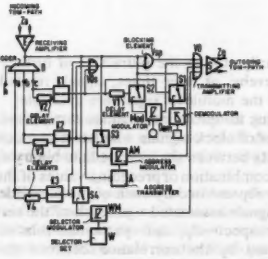
Int. Cl.² H04Q 11/04

U.S. Cl. 179—15 BA 4 Claims

References Cited

UNITED STATES PATENTS

3,586,782	6/1971	Thomas	179/15 AL
3,643,030	2/1972	Sparrenoahl	179/15 AL X
3,731,002	5/1973	Pierce	179/15 AL
3,752,932	8/1973	Frisone	179/15 AL



1. A method for operating a PCM time division multiplex telecommunications network utilizing terminal exchanges in the system wherein subscriber stations forming a connection receive the PCM information intended for them responsive to interpretation of their respective addresses which are transmitted from an exchange at the sending end in conjunction with message signals, comprising the steps of:

transmitting addresses of subscriber stations from which message signals are to be sent, from terminal exchange in said network in the time slot allocated for a given connection,

producing message signals from each subscriber station responsive to that subscriber station receiving its address in the time slot allocated to said connection, and

modulating in said subscriber stations an unmodulated byte sent following said addresses in accordance with the message signal to be sent and relaying the modulated result in the desired direction of transmission.

B 503,371

FADE-IN AND FADE-OUT SWITCHING CIRCUIT

Masanobu Sasaki, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sept. 5, 1974, Ser. No. 503,371

Claims priority, application Japan, Sept. 7, 1973, 48-100870

Int. Cl.² H03K 17/60

U.S. Cl. 307—251 8 Claims

References Cited

UNITED STATES PATENTS

3,560,726	2/1971	Platt et al.	307/251 X
3,621,304	11/1971	Houpt	307/251 X
3,654,394	4/1972	Gordon	307/251 X
3,662,113	5/1972	Recklinghausen	307/251 X
3,740,581	6/1973	Pfiffner	307/251
3,757,139	9/1973	Hunter	307/251
3,868,718	2/1975	Arai	307/304 X

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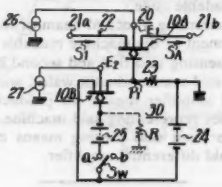
Heiering, "Feldeffekttransistoren als Koppelpunkte in der Fernsprechtechnik;" Heft 10, 1970, NTZ (German), pp. 522–526.



1. A switching circuit comprising first and second semiconductor devices each including a semiconductor substrate having a current path portion, first and second semiconductor regions forming a PN-junction therebetween, said first region being capacitively coupled to said current path portion, a control electrode connected to said second region, first and second terminals electrically connected to both ends of said current path portion respectively, a signal input terminal electrically connected to said first terminal of said first semiconductor device, an output terminal electrically connected to said second terminal of said first semiconductor device, means for connecting said control electrode of said first semiconductor device to said first terminal of said second semiconductor device, means for applying a bias voltage to said second terminal of said second semiconductor device, switch means for selectively applying a bias voltage to said control electrode of said second semiconductor device and neutralization means operative on at least one of said first and second semiconductor devices for injecting carriers into said first region of said device to independently control a fade-in and fade-out time.

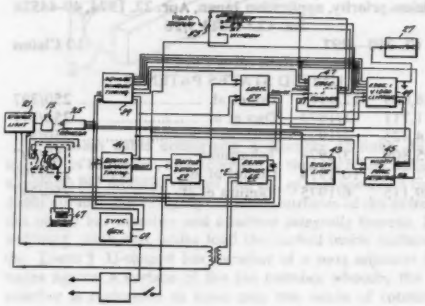
B 520,227
METHOD AND APPARATUS FOR VIDEO INSPECTION OF ARTICLES OF MANUFACTURE

Jack T. Van Oosterhout, Conklin, N.Y., assignor to Ball Corporation, Muncie, Ind.

Filed Nov. 1, 1974, Ser. No. 520,227
Int. Cl.² H04N 7/18
U.S. Cl. 178—6 18 Claims

References Cited
UNITED STATES PATENTS

2,798,605	7/1957	Richards	178/DIG. 37
3,049,588	8/1962	Barnett	178/DIG. 1
3,560,096	2/1971	Watson et al.	178/6
3,579,249	5/1971	Dewey et al.	178/DIG. 37
3,647,961	3/1972	Blitchington et al.	178/DIG. 37
3,746,784	7/1973	Van Oosterhout	178/6.8



1. An apparatus for video inspection of articles of manufacture comprising:

a light source for providing light rays to illuminate a sample article,

a video camera means for scanning said illuminated sample and for producing for each scan line a video signal corresponding to the difference in refraction characteristics of the portion of the sample scanned, and

means connected to said camera for processing the output signal thereof to produce a defect output signal in response to a scanned defect in said sample, said processing means including

means for suppressing a predetermined portion of the video signal received from said camera means during each of said scan lines, and

means for continuously discriminating between the video signals corresponding to desired changes in the refraction characteristics of said sample as said camera scans across said sample and the refraction characteristic produced by defects in said sample.

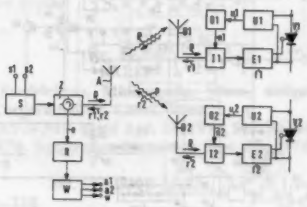
B 529,925
CIRCUIT FOR CONTROLLING A SEMI-CONDUCTOR VALVE

Oskar Beckmann, St. Polten, Austria, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Dec. 5, 1974, Ser. No. 529,925
Claims priority, application Germany, Dec. 5, 1973, 2360670
Int. Cl.² G08B 23/00
U.S. Cl. 340—171 R 13 Claims

References Cited
UNITED STATES PATENTS

3,253,588	5/1966	Vuilleumier	340/224 X
3,643,260	2/1972	Clarke	343/225 R
3,713,101	1/1973	Piccone	343/225 X
3,798,642	3/1974	Augenblick	343/225 X
3,806,905	4/1974	Strenglein	340/224 R



1. In apparatus for the wireless transmission of a control signal to the control path of a controllable semiconductor valve said apparatus including a high frequency transmitter including means for generating a carrier and means to modulate the carrier by the control signal to form a modulated signal and an antenna connected to said transmitter for radiating said modulated signal, and a high frequency receiver coupled to an antenna for receiving said modulated signal, said receiver including means for demodulating said signal and feeding the demodulated control signal to the control path of the semiconductor valve, the improvement comprising:

a. means coupled to the semiconductor valve providing an output state signal representing the state of said semiconductor valve;

b. a controllable reflecting modulation means terminating the antenna of the high frequency receiver, having a control input coupled to said means providing a state signal, for remodulating a portion of the received transmission and reflecting it as a return signal over said receiver antenna;

c. a modulation dependent signal filter coupled to the antenna of the high frequency transmitter providing said return signal as an output; and

d. a return signal receiver coupled to the output of said modulation dependent signal filter.

B 545,344

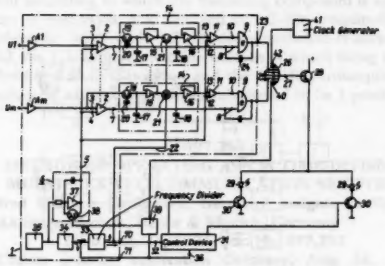
APPARATUS FOR RECORDING VARIABLE MEASUREMENT QUANTITIES THAT CAN BE TRANSLATED INTO ELECTRICAL CURRENT OR VOLTAGE VARIATIONS

Gerd Kuligowski, and Konrad Von Hessberg, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Jan. 27, 1975, Ser. No. 545,344
Claims priority, application Germany, Jan. 29, 1974, 2404550
Int. Cl.[2] G01D 9/28, 9/42
U.S. Cl. 346—35 8 Claims

References Cited
UNITED STATES PATENTS

3,781,783	12/1973	Tucker	346/108 X
3,803,631	4/1974	Nucklos et al.	346/35



1. Apparatus for use in controlling the operation of a row of light-emitting components, said components being arranged transversely to the direction of motion of a light sensitive record carrier and being used to optically record thereon variable measurement quantities that can be translated into varying electrical signals, comprising:

an amplitude discriminator arrangement for causing said components to emit light onto said record carrier for given values of said quantities including:

a periodically operating integration arrangement having an input and an output;

a voltage reference source connected to said input, and

a number of comparators, each comparator having a first input connected to the output of said integration arrangement and a second input to which one of said electrical signals are applied, each of said comparators further having an output;

an OR logic circuit having a plurality of inputs connected to corresponding ones of said outputs of said comparators;

a first electronic switch having a control terminal coupled to the output of said OR logic circuit;

an auxiliary circuit including said first electronic switch and a first number of further electronic switches, said first electronic switch being arranged in series with said further electronic switches and with said components;

a cyclically operating control device for actuating said further switches; and,

frequency means for controlling the periodic operation of said integration arrangement and for actuating said control device to begin operation anew with each start of the period of operation of said integration arrangement.

B 569,293

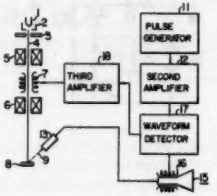
APPARATUS FOR DISPLAYING IMAGE PRODUCED BY ELECTRICALLY CHARGED PARTICLE BEAM

Seishiro Sato, Hitachi; Toshihiro Furuya, Katsuta, and Yasushi Saito, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 18, 1975, Ser. No. 569,293
Claims priority, application Japan, Apr. 22, 1974, 49-44524
Int. Cl.[2] H01J 3/26
U.S. Cl. 250—397 10 Claims

References Cited
UNITED STATES PATENTS

3,628,009	12/1971	Dol et al.	250/397
3,711,711	1/1973	Dao et al.	250/311
3,714,425	1/1973	Someya	250/311
3,795,809	3/1974	Takashima	250/397
3,842,272	10/1974	Coates et al.	250/397
3,889,115	6/1975	Tamura et al.	250/397



1. An apparatus for displaying an image produced by electrically charged particle beam, comprising first deflection means for scanning a specimen bi-dimensionally with said electrically charged particle beam, detection means for detecting information signal produced by said specimen illuminated with said electrically charged particle beam, display means for displaying an image of said specimen by utilizing said information signal detected by said detection means, second deflection means provided in said display means, and wave form detection means for detecting the wave form of a deflection signal produced in said second deflection means, whereby said first deflection means is energized by the output signal from said wave form detection means.

REISSUES

MARCH 30, 1976

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 28,746
CHAIN CABLE

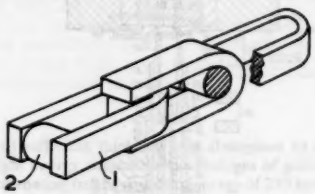
Peter Bruce, 10 Torphichen Place, Edinburgh, EH3 8DU, Scotland

Original No. 3,810,358, dated May 14, 1974, Ser. No. 190,192, Oct. 18, 1971. Application for reissue Apr. 21, 1975, Ser. No. 569,594

Claims priority, application United Kingdom, Oct. 20, 1970, 49665/70

Int. Cl.[2] F16G *13/12*

U.S. Cl. 59—78 5 Claims



1. A chain cable comprising a plurality of links, joined together in sequence, characterised in that each link includes a uniform bar member [bent into a] *of* U-shape and a cylindrical pin member bridging the inside surfaces of the extremities of the bar member and attached *integrally* thereto [by welding] such that under load the curved inside surface of the [bent] U-shaped bar member of a next adjacent link mates against a surface of the pin member whereby the pin member is restrained to have only one mode of rotational freedom relative to the next adjacent link, the radius of curvature of the cylindrical mating surface of the pin member being substantially equal to half the distance separating the inside surfaces of the extremities of the bar member and the cross-sectional area of the material of the pin member being not less than 1.1 times the cross-sectional area of a limb of the uniform bar member.

Re. 28,747
METHOD AND APPARATUS FOR ENGRAVING CHARACTERS

Herman Graboyes, Cherry Hill, N.J., assignor to Numerical Control Program Service, Inc., Moorestown, N.J.

Original No. 3,628,417, dated Dec. 21, 1971, Ser. No. 814,684, Apr. 9, 1969. Application for reissue Dec. 10, 1974, Ser. No. 531,255

Int. Cl.[2] B23C *1/16*

U.S. Cl. 90—13 C 8 Claims

1. A method of engraving inside corners of embossed characters with a numerically controlled machine tool device comprising the steps of:

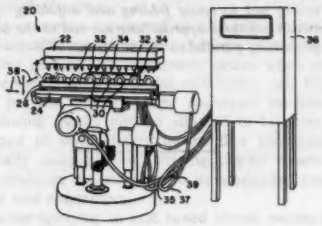
providing a rotatably mounted cutting tool having a tapered cutting portion;

rotating said cutting tool;

moving said cutting tool to an apex of an inside corner;

positioning [the] *a* tip of said cutting tool at a plurality of successive depths with respect to [the] *a* land of said character *at the apex of the inside corner;*

moving said cutting tool with respect to the land of said character about [the] *a* desired outline of said character *at the apex of the inside corner* so that [the] *an* axis of said tool *is moved vertically and horizontally* at each of said depths *so that the tool* is spaced from [the] *a desired* borderline of said character a distance equal to [the] *a* radius of said tool in [the] *a* plane of said land of said character;



whereby the radius on said inside corner is reduced to the radius of said tool in the plane of said land of said character when said tip of said tool is at a depth with respect to the land of said character which is the smallest of said successive depths.

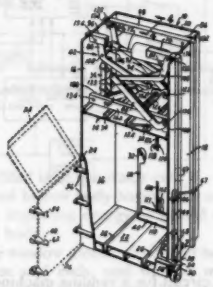
Re. 28,748
BALER

Wallace F. Fredrickson, Minneapolis, Minn., assignor to Muncher Corporation, St. Cloud, Minn.

Original No. 3,728,959, dated Apr. 24, 1973, Ser. No. 84,371, Oct. 27, 1970. Application for reissue Sept. 23, 1974, Ser. No. 508,179

Int. Cl.[2] B30B *15/32*

U.S. Cl. 100—218 23 Claims



19. A baler for baling refuse and the like and having a large charging area into which refuse is received, the baler comprising:

a pressing box;

a pressing platen movable axially within the box to compress refuse into a bale;

a toggle mechanism for moving the platen axially of the box in a long stroke between a withdrawn position permitting refuse to be charged to the pressing box and an extended position for compressing refuse in the box into a bale, the toggle mechanism comprising a pair of opposed sets of arms, each set including first and second arms foldably joined at their ends and having their other ends pivotally attached adjacent a side of the box to the box and to the platen, respectively, the other ends of one set of arms attached adjacent one side of the box and the other ends of the opposed set of arms attached adjacent an opposed side of the

box, the first and second arms of each set being foldable inwardly of the box and being of sufficient length and mutually positioned so as to cross the respective first and second arms of the other set without interference as the arms are simultaneously and compactly folded inwardly of the box into a position approaching normal to the box axis; and

a hydraulic cylinder and piston connected transversely between opposing arms adjacent their other ends and oriented to provide force in a direction normal to the axis of the pressing box to cause folding and unfolding of the arms between positions approaching normal to the box axis and approaching parallel to the box axis.

Re. 28,749

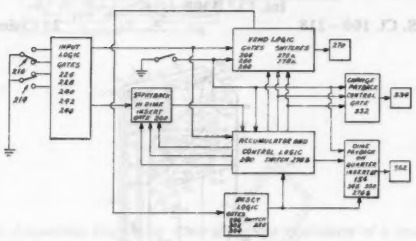
COIN CONTROLLED MEANS FOR VENDING MACHINES AND THE LIKE

James C. Douglass, Crestwood, Mo., assignor to H. R. Electronics Company, High Ridge, Mo.

Original No. 3,754,629, dated Aug. 28, 1973, Ser. No. 204,988, Dec. 6, 1971. Application for reissue Apr. 28, 1975, Ser. No. 572,437

Int. Cl.² G07F 9/04

U.S. Cl. 194—1 N **21 Claims**



1. In a control circuit for a vending machine having a coin unit capable of accepting coins of more than one denomination and including a plurality of coin switches one of which is actuatable by all acceptable coins, a second of which is actuatable only by coins greater in value than the lowest acceptable denomination, the improvements comprising means to prevent false entries due to faulty coin switch operation including a first pair of NAND gates each having an input operatively connected to the first coin switch, means cross-connecting another input of each of the gates of said first pair to the output of the other gate of said first pair of NAND gates, a second pair of NAND gates each having an input operatively connected to the second coin switch, means cross-connecting a selected one of the inputs of each of the NAND gates of the second pair of NAND gates to the output of the other gates of said second pair, and means connecting the output of one of the gates of said [second] *first* pair to one of the inputs of said [first] *second* pair whereby outputs of said [second] *first* pair are applied to the input of said [first] *second* pair.

Re. 28,750

METHOD OF FITTING PRESSURIZED SPRAYING CONTAINERS

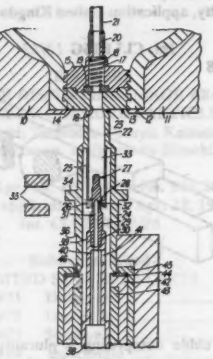
Yves Le Troadec, Mont-Saint-Aignon, France, assignor to Rhone-Poulenc S. A., Paris, France

Original No. 3,694,534, dated Sept. 26, 1972, Ser. No. 87,362, Nov. 5, 1970. Division of Ser. No. 817,818, April 21, 1969, Pat. No. 3,605,791. Application for reissue July 22, 1974, Ser. No. 490,888

Claims priority, application France, July 15, 1968, 68.159238

Int. Cl.² B29C 17/07; B65B 3/04, 7/28, 43/00

U.S. Cl. 264—98 **2 Claims**



1. A method of manufacturing a filled, pressurized spraying container, comprising the steps of:

a. forming a valve assembly comprising, in combination:

aa. a valve body;

bb. means defining a passageway through said valve body;

cc. an annular valve seat within said passageway;

dd. a detachable sleeve mounted on said body externally thereof and coaxial with said passageway;

ee. a valve member releasably located within said sleeve;

ff. retaining means locating said valve member in said sleeve; and

gg. means defining openings in said retaining means;

b. providing a container;

c. mounting said valve assembly on said container, with said valve body sealed thereto and said passageway communicating with the container interior;

d. injecting filling fluid through said sleeve, past said valve member, through said openings and said passageway, into said container interior;

e. forcing said valve member from said sleeve into said passageway beyond the valve seat to form an openable seal on said valve seat; and

f. detaching said sleeve from said valve body.

Re. 28,751

X- AND GAMMA-RAY SENSITIVE IMAGE INTENSIFICATION TUBE

Jack Ball, Chesterland, Ohio, assignor to Varian Associates, Palo Alto, Calif.

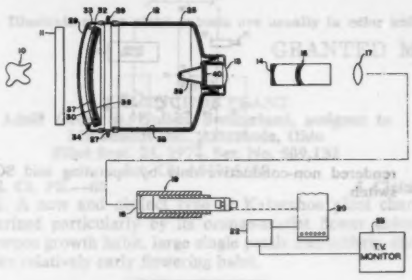
Original No. 3,558,893, dated Jan. 26, 1971, Ser. No. 612,629, Jan. 30, 1967. Application for reissue Oct. 17, 1973, Ser. No. 407,076

Int. Cl.² H01J 31/50

U.S. Cl. 250—213 VT **12 Claims**

1. In an image-forming device including an image intensification tube, *said tube including an evacuated envelope*, and *said device further including* means to reproduce an image output from said tube, an improved image tube input phosphor layer comprising:

a. a single crystalline sheet *of cesium iodide, said sheet being* of substantially uniform thickness *and being located within said evacuated envelope;*
b. said sheet having the following physical properties:
i. photoluminescent and transparent to its own light;
ii. efficient in absorption of ray energy;



iii. of sufficient thickness and absorption to convert to light energy substantial percentages of gamma energy emanating from a source of energy of 250 kev. or less;
iv. of high resolution characteristics; and
v. dish-shaped in configuration and focused to an accelerating electron field in said tube.

Re. 28,752

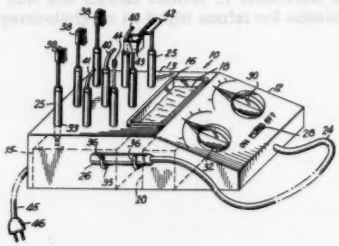
ULTRASONIC KITS AND MOTOR SYSTEMS

Lewis Balamuth, New York; Arthur Kuris, Riverdale, and Manual Karatjas, Glen Oaks, all of N.Y., assignors to Ultrasonic Systems, Inc., Farmingdale, N.Y.

Original No. 3,809,977, dated May 7, 1974, Ser. No. 119,298, Feb. 26, 1971. Application for reissue Jan. 27, 1975, Ser. No. 544,134

Int. Cl.² H01V *7/00*

U.S. Cl. 318—116 **34 Claims**



1. An ultrasonic system including
A. a cabinet;
B. driving circuit means for providing an electrical driving signal of a desired ultrasonic frequency including tuned circuit means tuned to said desired frequency for controlling the frequency of said driving signal;
C. adapter means including a first connector coupled to said driving circuit means for transmission of said driving signal;
D. a plurality of means each adapted to be interchangeable with each other and releasably connected to said adapter means and forming part thereof to permit a variety of applications to be performed, said adapter means and interchangeable means when assembled being adapted to be hand held by a user and including:
1. a housing means capable of being hand held,
2. an ultrasonic motor capable of vibration at more than one frequency including said desired frequency mounted within at least a portion of said housing means and having a portion extending outside of said housing means portion for transmission of high frequency mechanical vibrations, said ultrasonic motor including:
a. a transmission member having a rear section and a front section with an output end for transmitting the generated mechanical vibrations,
b. transducer means connected to said rear section, said interchangeable means being in the form of an accessory [forming part of said instrument means when assembled therewith and] including said motor, said housing means portion, and a second connector mounted on said housing means portion adapted to be releasably connected to said adapter means first connector for electrically coupling said driving circuit means and said transducer means when in its assembled position through said connectors,
E. means for applying to said tuned circuit means a detected signal representative of the frequencies of vibration of said motor, said tuned circuit means responding to the desired frequency portion of said detected signal to cause said driving signal means to produce a driving signal of said desired frequency; and
F. support means associated with said cabinet for holding said assembled adapter means and interchangeable means in fixed [positive] *position* relative to said cabinet when not in use.

Re. 28,753

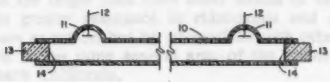
LASER CELL

Alfred T. Zavodny, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Original No. 3,656,067, dated Apr. 11, 1972, Ser. No. 35,781, May 8, 1970. Application for reissue Mar. 12, 1973, Ser. No. 340,419

Int. Cl.² H01S *3/03*

U.S. Cl. 331—94.5 C **3 Claims**



1. In a fluid-filled laser generator cell:
a. an elongated hollow body having first and second ends;
b. means for imparting energy to a fluid to be contained within said body;
c. *non-closure* window means within said body at a position intermediate said ends, said window means being oriented with respect to the longitudinal axis of said body at an angle about equal to its Brewster angle; and
d. closure means *at* at least one of said ends in association with means for reflecting oriented about perpendicularly to said longitudinal axis.

Re. 28,754

BED EGRESS ALARM CIRCUIT

Kenneth J. Cook, Oak Park, and Norman H. Horwitz, West Bloomfield, both of Mich., assignors to William Beaumont Hospital, Royal Oak, Mich.

Original No. 3,852,736, dated Dec. 3, 1974, Ser. No. 337,955, Mar. 5, 1973. Application for reissue May 16, 1975, Ser. No. 578,206

Int. Cl.² G08B *21/00*

U.S. Cl. 340—279 **10 Claims**

1. A condition responsive circuit for signalling the departure of a patient from a bed or the like by generating an output signal upon the opening of a switch, comprising:

a switch being normally closed by the weight of a patient in a bed;

an FET having source, drain and gate electrodes, said gate electrode connected to said switch for normally drawing only a nominal current and for continuously biasing said gate electrode to render said FET non-conductive;

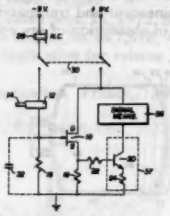
a normally off output means coupled to said at least one of *said* source and drain electrodes for generating an output signal when said FET is rendered conductive;

the opening of said switch to remove the continuous bias from said gate electrode;

delay means coupled to said switch and said gate electrode for maintaining a bias at said gate electrode to prevent said FET from being rendered conductive for a predetermined time interval after the opening of said switch; and

said output means including an SCR, an SCR switch, and a signal means, all connected in series;

said SCR being rendered conductive by said FET being rendered conductive to thereby generate an output signal from said signal means, and said SCR being thereafter



rendered non-conductive only by operating said SCR switch.

PLANT PATENTS

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

GRANTED MARCH 30, 1976

3,851
KALANCHOE PLANT
Adolf Grob, St. Gallen, Switzerland, assignor to Mikkelsens Inc., Ashtabula, Ohio
Filed Sept. 25, 1974, Ser. No. 509,132
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct type of Kalanchoe plant characterized particularly by its orange-scarlet flower color, vigorous growth habit, large single petals and umbels, and by its relatively early flowering habit.

3,852
KALANCHOE PLANT
Adolf Grob, St. Gallen, Switzerland, assignor to Mikkelsens Inc., Ashtabula, Ohio
Filed Sept. 25, 1974, Ser. No. 509,133
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of Kalanchoe characterized particularly by its intense orange colored flowers; abundant flowering with short response time, 12 weeks in summer and 14 weeks in winter; its compact growth habit with short but strong stems, and by its ability to flower year round when given short day treatment in the greenhouse.

3,853
KALANCHOE PLANT
Adolf Grob, St Gallen, Switzerland, assignor to Mikkelsens Inc., Ashtabula, Ohio
Filed Sept. 25, 1974, Ser. No. 509,143
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of Kalanchoe characterized particularly by its bright scarlet red colored flowers; strong roots, fast growth habit, and by its abundant flowering and relatively large flowers.

3,854
KALANCHOE PLANT
Adolf Grob, St. Gallen, Switzerland, assignor to Mikkelsens Inc., Ashtabula, Ohio
Filed Sept. 25, 1974, Ser. No. 509,146
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of Kalanchoe characterized particularly by its yellow flower color, tight structure, relatively long flowering period, rounded foliage, and strong growing habit.

3,855
AZALEA PLANT
James W. Hines, Jr., Corona Del Mar, Calif. assignor to Hines Wholesale Nurseries, Santa Ana, Calif.
Filed Nov. 25, 1974, Ser. No. 526,639
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—55 **1 Claim**

1. A new and distinct variety of azalea plant which is a sport of Azalea "Rose Queen," and characterized in particular to novelty by the clean-looking white coloration of its flowers which grow profusely above and among rich green foliage; by the almost simultaneous full-bloom flowering toward the end of December; by its compact and thickly branched habit of growth; by its flowers which are larger than most other strains of azaleas; and by its greater resistance to rhizoctonia and other root diseases as established by comparison with other varieties grown in the same general area of the Irvine Ranch in southern California.

PLANT PATENTS

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawings.

GRANTED MARCH 30, 1976

3,931
KALANCHOE PLANT
Adolf Groh, St. Cloud, Switzerland, assignor to Mikkelsen Inc., Ashtabula, Ohio
Filed Sept. 25, 1974, Ser. No. 509,133
Int. Cl. A01h 5/00
U.S. Cl. PP.—68 1 Claim

1. A new and distinct type of Kalanchoe plant characterized particularly by its orange-scarlet flower color, vigorous growth habit, large single corals and medium, and by its relatively early flowering habit.

3,932
KALANCHOE PLANT
Adolf Groh, St. Cloud, Switzerland, assignor to Mikkelsen Inc., Ashtabula, Ohio
Filed Sept. 25, 1974, Ser. No. 509,132
Int. Cl. A01h 5/00
U.S. Cl. PP.—68 1 Claim

1. A new and distinct cultivar of Kalanchoe characterized particularly by its intense orange colored flowers; prominent flowering with short response time, 12 weeks in summer and 14 weeks in winter to compact growth habit with short but strong stems, and by its ability to flower year round when grown short day treatment in the greenhouse.

3,933
KALANCHOE PLANT
Adolf Groh, St. Cloud, Switzerland, assignor to Mikkelsen Inc., Ashtabula, Ohio
Filed Sept. 25, 1974, Ser. No. 509,142
Int. Cl. A01h 5/00
U.S. Cl. PP.—68 1 Claim

1. A new and distinct cultivar of Kalanchoe characterized particularly by its bright coralet red colored flowers; prominent flowering with short response time, 12 weeks in summer and 14 weeks in winter to compact growth habit with short but strong stems, and by its ability to flower year round when grown short day treatment in the greenhouse.

3,934
KALANCHOE PLANT
Adolf Groh, St. Cloud, Switzerland, assignor to Mikkelsen Inc., Ashtabula, Ohio
Filed Sept. 25, 1974, Ser. No. 509,143
Int. Cl. A01h 5/00
U.S. Cl. PP.—68 1 Claim

1. A new and distinct type of Kalanchoe plant characterized particularly by its orange-coral flower color, vigorous growth habit, large single corals and medium, and by its relatively early flowering habit.

3,935
KALANCHOE PLANT
Adolf Groh, St. Cloud, Switzerland, assignor to Mikkelsen Inc., Ashtabula, Ohio
Filed Sept. 25, 1974, Ser. No. 509,134
Int. Cl. A01h 5/00
U.S. Cl. PP.—68 1 Claim

1. A new and distinct cultivar of Kalanchoe characterized particularly by its yellow flower color, light strong stems, relatively long flowering period, rounded foliage, and strong growing habit.

3,936
ARALEA PLANT
James W. Hines, Jr., Corona Del Mar, Calif., assignor to Hines Wholesale Nurseries, Santa Ana, Calif.
Filed Nov. 25, 1974, Ser. No. 526,827
Int. Cl. A01h 5/00
U.S. Cl. PP.—68 1 Claim

1. A new and distinct variety of Aralea plant which is a sport of Aralea "Nina Queen" and characterized in particular as novelty by the deep-lobbing white coloration of its flowers which grow profusely above and among rich green foliage by the almost simultaneous full-bloom flowering toward the end of December by its compact and thickly branched habit of growth, by its flowers which are larger than most other aralia of Japanese and by its greater tolerance to chlorosis and other root diseases as established by comparisons with other varieties grown in the same geographical area of the Irvine Ranch in southern California.

PATENTS

GRANTED MARCH 30, 1976

ERRATA

For CLASS	See PATENT NO.
073–061.1 R	3,946,625
350–096 C	3,947,182
350–160 LC	3,947,183
350–160 LC	3,947,184
350–160 LC	3,947,185
351–017	3,947,186
352–072	3,947,187
353–076	3,947,188
353–038	3,947,189
355–003 R	3,947,190
403–334	3,947,191
404–041	3,947,192
415–143	3,947,193
417–212	3,947,194
324–029	3,947,329
204–009	3,947,348
200–005 R	3,947,390
200–016 D	3,947,391
252–465	3,947,486
423–632	3,947,502
204–159.17	3,947,525
340–253 B	3,947,859

PATENTS

GRANTED MARCH 30, 1976

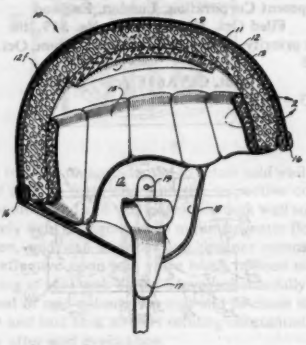
ERRATA

PATENTS

GRANTED MARCH 30, 1976

GENERAL AND MECHANICAL

3,946,441
SAFETY HELMET
John R. Johnson, Arcadia, Calif., assignor to Land Tool Company, Wichita, Kan.
Filed Mar. 19, 1973, Ser. No. 342,600
Int. Cl. A42B *3/02*
U.S. Cl. 2—3 R **12 Claims**



1. A safety helmet comprising a primary shell constructed of a preselected material having tough impact resistant properties and yet fractures upon substantial impact shaped to be worn on the head of a user,

a relatively thin shell constructed of a different material from said preselected material arranged in a preselected relationship on the outside of the primary shell to contain the primary shell and having physically brittle properties to fracture upon minor impacts but to hold together in one piece to thereby contain the primary shell including upon substantial impacts to thereby complement the properties of the inner shell, whereby the materials coact to cancel out the negative features of each of the materials and making use of the advantages of both materials so as to provide a helmet that is virtually indestructible, and

a shock absorbing liner secured to the inside of the primary shell.

3,946,442
HELMET VISOR
Bengt Olof Henrik Wallander, Stockholm, Sweden, assignor to Conort Engineering AB, Stockholm, Sweden
Filed Sept. 20, 1972, Ser. No. 291,619
Claims priority, application Sweden, Sept. 22, 1971, 11987/71
Int. Cl.[2] A61F *9/06*
U.S. Cl. 2—9 **9 Claims**

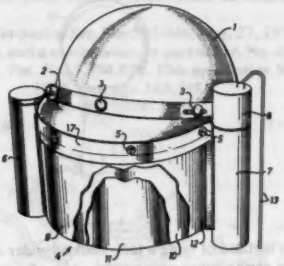
1. A visor apparatus for mounting to a helmet comprising:

a transparent support having a configuration corresponding to the shape of said helmet and located on said helmet in a field of a wearer of said helmet,

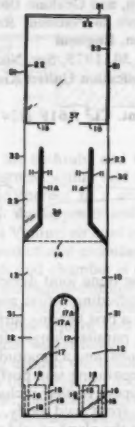
a transparent movable film material extending in front of said wearer's field of sight,

a supply roll mounted on one side of edge of said support and containing a new supply of movable film, and

a take-up roll mounted on the other side edge of said support for receiving said film material after it has accumulated sight restricting deposits thereon and wherein an anti-frictional layer is provided between said transport film material and said support to avoid scratching of said support and/or said film material.



3,946,443
DISPOSABLE RAIN GARMENT
Hoye Knight, New York, N.Y., assignor to Raymond Lee Organization, Inc., New York, N.Y.
Filed Jan. 17, 1973, Ser. No. 324,293
Int. Cl.[2] A41D *3/08*
U.S. Cl. 2—82 **5 Claims**



1. A disposable outergarment to be worn over the customary clothing as a protection from rain and splatter, which is adaptable for storage prior to use and prior to dispensing on a roll, comprising two layers of plastic sheeting of generally uniform width which is formed with a lateral tear line so as to separate a pants section from a waist section, with shaped tear lines and shaped seams joining both layers in the pants section to form two separate leg sections of the pants section, and with shaped tear lines and shaped seams joining both layers in the waist section to form two separate arm sections in the waist section.

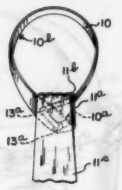
3,946,444
METHOD OF TYING A NECKTIE

Salvatore C. Parrilla, 6198 Stratford Drive, Parma Heights, Ohio 44130

Substitute for Ser. No. 165,515, July 26, 1971, abandoned. This application Jan. 13, 1975, Ser. No. 540,415

Int. Cl.² A41D *25/00*

U.S. Cl. 2—144 **1 Claim**



1. The method of tying a long necktie wider at one end and narrower at the other around the neck of a wearer, said tie having at least two longitudinally spaced bound small through openings in its mid-portion, comprising threading the narrower end of said tie up and down through said openings forming a loop to pass around the wearer's neck, tightening said loop by pulling said narrower end through said openings, and passing the wider end of said tie upwardly through said loop on the side toward the neck of the wearer and then forward over the loop and downward to hang in display fashion in front of the wearer with said wider portion covering said narrower portion in said openings.

3,946,445
ENDOPROSTHETIC BONE JOINT

George Bentley, Bladon, and Graham Deane, Chesterton, both of England, assignors to National Research Development Corporation, London, England

Filed Apr. 30, 1975, Ser. No. 573,155

Claims priority, application United Kingdom, May 3, 1974, 19558/74

Int. Cl.² A61F *1/24*

U.S. Cl. 3—1.91 **7 Claims**

1. An endoprosthetic bone joint device, comprising:

a first component including a first rounded body partially recessed to define a first bearing surface consisting of two similar, generally parallel, longitudinally concave, arcuate elongate portions, and a longitudinally concave, arcuate rib laterally separating said portions;

and said first component further including a first stem projecting integrally from said body, remotely from said bearing surface, in the plane of said rib, and in an inclined direction relative to the arcuate bisector of said rib;

and a second component including a second rounded body partially recessed to define a second bearing surface consisting of two similar, generally parallel, longitudinally convex, arcuate ribs, and a longitudinally convex groove laterally separating said convex ribs;

and said second component further including a second stem projecting integrally from said second body, remotely from said second bearing surface, in the plane of said convex groove, and generally parallel to the arcuate bisector of said convex groove;

said first and second bearing surfaces being of generally complementary form in mutual engagement, with said concave rib received in said convex groove, and with said convex ribs received on said concave portions;

said concave portions and rib, and said convex ribs and groove, respectively subtending angles less and greater than 180° to allow longitudinal arcuate sliding between said components;

and said convex groove being widened towards one end thereof to allow lateral rocking between said components.

3,946,446
PROSTHETIC BONE JOINT

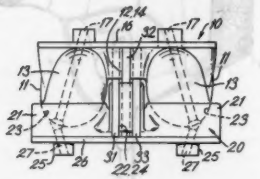
Jack Schofield, Wirral, England, assignor to National Research Development Corporation, London, England

Filed Oct. 30, 1974, Ser. No. 519,206

Claims priority, application United Kingdom, Oct. 31, 1973, 50594/73

Int. Cl.² A61F *1/24, 1/04*

U.S. Cl. 3—1.91 **9 Claims**



6. A prosthetic bone joint device comprising:

first and second bearing components each having a pair of respectively convex and relatively concave bearing surfaces in side-by-side spaced disposition, said bearing surfaces being mutually engaged for rotational movement at least about a direction bridging the respective bearing surfaces;

at least two elongate flexible members connected at opposite ends to respectively different ones of said components in a diagonally crossed configuration extending transversely relative to said direction;

and at least one plate separably engaged with one of said components remotely from the respective bearing surfaces to clamp portions of said elongate members therebetween, said plate spanning said one component in said direction, and said plate and said one component having aligned bores therethrough to afford screw securement to a bone.

3,946,447
AUXILIARY WATER SAVING ATTACHMENT FOR WATER CLOSETS

Jacob R. Moon, Hillsborough, N.C., assignor to Moon Water Saver, Inc., Hillsborough, N.C.

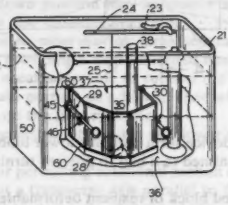
Filed Oct. 21, 1971, Ser. No. 191,228

Int. Cl.² A47K *17/00*; E03D *1/22*

U.S. Cl. 4—1 **11 Claims**

1. In a water closet of the type having a tank formed by bottom and side walls and providing a hydraulic head and storage of predetermined height and capacity, having a movable flush valve mounted in the bottom wall of the tank and seated in one end of a conduit connecting the tank to a lower positioned bowl, having manual handle means to open the valve to empty the tank and cooperative water supply means for refilling the tank upon the valve returning to a closed position, the opening of the valve normally causing initiation of flushing and bowl evacuation followed by substantial emptying of the tank and then closing of the valve, the improvement comprising, in combination:

a. an auxiliary thin rectangular wall member adapted to be vertically positioned and bent within the tank into a U-like form whereby the end edges of the wall member contact an interior vertical wall surface of the tank and one of the side edges of the wall member contacts the interior bottom wall surface to form in effect an open top column extending above and around the valve and closed at the bottom by the bottom wall of the tank and closed at the sides by said interior vertical wall surface forming a continuation of the wall area of said wall member; and



b. spring retainer means adapted to retain said wall member in said column form and with the respective contacting wall member end and side edges and tank wall surfaces in relatively tight engagement to minimize water flow therebetween, said wall member and retainer means thereby being effective upon said valve being opened to prevent emptying of said tank below a level substantially equal to the level of said column top end and to cause said valve to seat and said tank to start refilling substantially immediately after said evacuation.

3,946,448

APPARATUS FOR DISINFECTION AND CHEMICAL PURIFICATION OF TOILET BOWLS

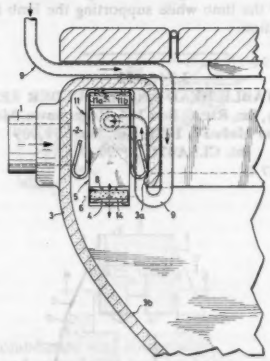
Tamim El Sioufy, Saarbruecken, Germany, assignor to MEKOPHARMA Dr. Becker & Cie. K.G., Saarbruecken, Germany

Filed Nov. 4, 1974, Ser. No. 520,942

Claims priority, application Germany, Nov. 2, 1973, 2355054; Oct. 17, 1974, 2450197

Int. Cl.² E03D 9/02

U.S. Cl. 4—223 **12 Claims**



1. Apparatus for disinfection and chemical purification of toilet bowls, comprising a storage container spaced from said bowl for a purifying and disinfecting liquid, and an automatically closing passage and outlet device which opens under the action of a flush flow, said passage and outlet device consisting of a valve capsule mounted in the cavity of the bowl edge near the water inlet opening of the bowl, said valve capsule being provided with a check valve and a flap actuated by the flush flow so as to open said check valve under the pressure of the flush flow, and fluid conveying means for feeding the disinfecting and purifying liquid to said valve capsule from said storage container.

3,946,449

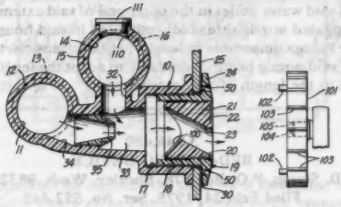
WHIRLPOOL JET FOR BATHTUBS

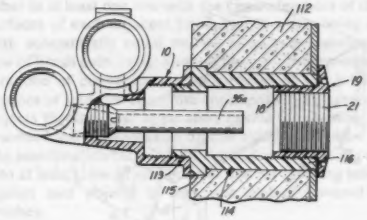
Cleo D. Mathis, 1808 Potrero Ave., South El Monte, Calif. 91733

Continuation-in-part of Ser. No. 392,046, Aug. 27, 1973, Pat. No. 3,890,855, and a continuation-in-part of Ser. No. 470,369, May 16, 1974, Pat. No. 3,890,856. This application Mar. 31, 1975, Ser. No. 563,795

Int. Cl.² A47K 3/10

U.S. Cl. 4—178 **11 Claims**





1. A whirlpool jet for bathtubs and the like comprising a housing, a chamber formed within said housing, a water inlet connected at one end thereof to a source of water supply under pressure and at the opposite end thereof to the inner end of said chamber, a Venturi air inlet extending through said housing to the inner end of said chamber, whereby the movement of water through said chamber is speeded by a Venturi effect, a water outlet extending through a circular opening in the wall of the bathtub, said water outlet being threadedly mounted within the outer end of said chamber, said water outlet having an annular radial flange, said flange having an inner surface abutting against the inside of the bathtub wall, said housing having a flat outer end abutting against the outside of the bathtub wall, said flange having a pair of diametrically spaced circular openings extending inwardly from its outer face for use in rotating said water outlet with respect to said housing in mounting said jet on a bathtub, and a circular wrench having a pair of transversely directed pins dimensioned and spaced to fit within said openings, the periphery of said wrench having knurling formed thereon for manually rotating said wrench to rotate said water outlet when said pins are mounted in said openings, said wrench having a square opening at the center thereof, said opening being adapted to receive the square head of a tool to rotate said wrench further and bring said flange into tighter engagement with said wall.

10. A whirlpool jet for bathtubs and the like comprising a housing, a chamber formed within said housing, a water inlet connected at one end thereof to a source of water supply under pressure and at the opposite end thereof to the inner

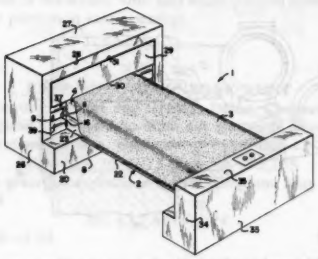
end of said chamber, a Venturi air inlet extending through said housing to the inner end of said chamber, whereby the movement of water through said chamber is speeded by a Venturi effect, a water outlet extending through a circular opening in the wall of the bathtub, said water outlet being threadedly mounted within the outer end of said chamber, an extension threadedly connected between said water outlet and said housing, said extension having an externally threaded inner end adapted to fit within the water outlet receiving opening in said housing and an internally threaded outer end adapted to receive said water outlet, said outer end being somewhat longer than the portion of said water outlet which fits therein so that said outer end is adapted to protrude beyond the edge of concrete poured around said extension, the protruding portion of said outer end being discardable so that the thickness of said concrete may vary without affecting the installation of said water outlet in the outer end of said extension, and an elongated nozzle threadedly mounted in said housing, said nozzle being comparable in length to said extension, the outer end of said nozzle being discardable to adapt the length of said nozzle to the length of said extension.

3,946,450

BED-MAKING DEVICE

Alvin D. Staggs, P.O. Box 778, Buckley, Wash. 98321

Filed Feb. 24, 1975, Ser. No. 552,445
Int. Cl.[2] A47C 21/00
U.S. Cl. 5—317 R **7 Claims**



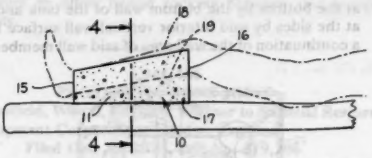
1. A bed-making device comprising:
a. a support structure having a head end and foot end, said support structure being adapted to support thereon a mattress;
b. spaced connected walls adjacent the head end defining a head chamber wider than the mattress;
c. spaced connected walls adjacent the foot end defining a foot chamber wider than the mattress;
d. a first roller in the head chamber and a second roller in the foot chamber, said rollers each having a length greater than the width of the mattress;
e. a web having respective opposite ends thereof operatively associated with said first roller and said second roller and extending longitudinally over the mattress;
f. a bedspread having opposite ends thereof removably connected to said web at respective longitudinally spaced apart locations, said bedspread having a greater width than the mattress to hang over sides thereof when overlying the mattress; and
g. at least one sheet having one end thereof removably connected to said web adjacent one end of said bedspread and movable into the head chamber when said first roller rotates in one direction and longitudinally onto the mattress when said first roller rotates in an opposite direction, said bedspread moving into the foot chamber as said one sheet moves onto the mattress.

3,946,451

LIMB SUPPORT

Donald C. Spann, 5 Ferncreek Court, Greenville, S.C. 29607

Filed Aug. 19, 1974, Ser. No. 498,400
Int. Cl.[2] A61G 7/02; A47C 22/00
U.S. Cl. 5—327 R **1 Claim**



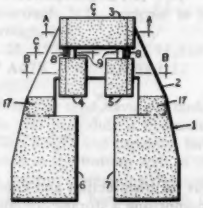
1. A support device for a patient's lower limb for use when the patient is confined to a bed to prevent turning of the limb comprising:
A. an elongated block of resilient deformable polyurethane foam material;
B. a flat bottom surface providing an elongated base for placement upon the bed surface:
C. a pair of spaced substantially vertical side surfaces;
D. a top planar surface inclined with respect to said bottom surface, and
E. an open continuous elongated arcuate groove of uniform cross section formed in said top planar surface along the entire length thereof defining first and second spaced inclined planar top portions extending the entire length of said block, said groove being inclined with respect to said bottom surface and being substantially semicircular in extent for providing a cradle for supporting and gripping a limb from a portion thereof adjacent the ankle to a portion thereof adjacent the knee;
whereby when a limb is placed in said central groove of the support, the support will deform over its entire length under the weight thereof exerted on a central lower portion of the groove causing depression of the resilient material therebeneath and inward flexing of upper portions of the groove tending to bring together said first and second top portions with resilient gripping of the limb within the entire length of said groove, thus avoiding turning of the limb while supporting the limb in an elevated position.

3,946,452

ADJUSTABLE HEAD AND SHOULDER REST

George D. Eary, Sr., Rte. 6, Box 264, Hagerstown, Md. 21740

Filed Mar. 17, 1975, Ser. No. 559,009
Int. Cl.[2] A47C 21/00, 7/32
U.S. Cl. 5—327 B **1 Claim**



1. An adjustable rest for the head and shoulder portion of the human body comprising:
a. a base member,
b. a pair of laterally adjustable spaced apart resilient shoulder members attached to, but not resting on said base

member adapted to support the shoulders and upper chest of a human body in facedown position on the said rest,

c. a face member having three distinctly separate, movable and removeable members, a larger one for the forehead, a smaller one for the left cheek extending below the left side of the chin, and a similar smaller one for the right cheek extending below the right side of the chin,

d. the face member being spaced longitudinally and generally about equidistant from each of the shoulder members, so that the head and shoulders of the human body in face-down position may be comfortably supported by said face and shoulder members,

e. said face member having three separate and moveable portions providing a near unlimited number of variations of open areas adaptable to receive the eyes and/or nose and mouth portion of a human face when in face-down position on the face member,

f. means for adjustably raising and lowering the face member,

g. means for permitting rotational motion of said face member about a transverse axis parallel to the base member,

h. means for varying the distance between the two cheek members of the face rest providing capability to support different face widths,

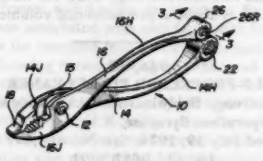
i. means for rotating the face member about a longitudinal axis (from cheek rests to center of forehead rest) allowing user to rest on the left or right side of the face at any angle up to approximately 45°.

3,946,453

COMBINATION PLIER, WRENCH AND SCREWDRIVER TOOL

Ruben J. Torres, 1238 N. Greenview, Chicago, Ill. 60622

Filed Jan. 27, 1975, Ser. No. 544,184
Int. Cl.² B25B *7/22*
U.S. Cl. 7—4 **9 Claims**



1. A combination tool comprising:

a first and second plier member having a jaw section and a handle section, said plier members being pivotally attached together to allow the jaws to be pivotally displaced toward and away from each other by moving the handle sections to and away from each other; and

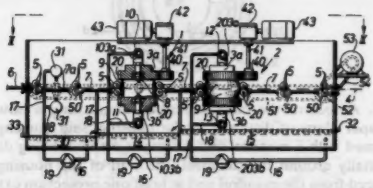
the jaw section of one of said plier members having its end formed into a screwdriver blade with the extreme end of the handle portion of said one plier member having a wide smooth portion for aiding in gripping and applying pressure when the tool is used as a screwdriver.

3,946,454

APPARATUS FOR CLEANING THE SURFACE OF PLATE-SHAPED OBJECTS BY MEANS OF AT LEAST TWO BRUSHES

Kurt Anders Holm, Skoghall, and Gote Jan Wilhelm Norstrom, Karlstad, both of Sweden, assignors to Uddeholms Aktiebolag, Uddeholm, Sweden

Filed Oct. 21, 1974, Ser. No. 516,573
Claims priority, application Sweden, Nov. 27, 1973, 73160327
Int. Cl.² A46B *13/04*
U.S. Cl. 15—77 **7 Claims**



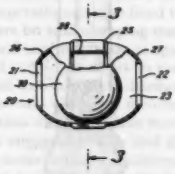
1. Apparatus for cleaning the surfaces of flat planar objects, particularly newly etched printed circuit cards, comprising a plurality of brush pairs, each of said brush pairs including two coaxially arranged brushes having bristle surfaces which face each other, means for conveying said planer objects through said apparatus along a plane extending between said facing bristle surfaces, said brush pairs being arranged adjacent each other in at least one row with the circumferences of the bristle surfaces of each adjacent brush pair in a row being arranged with substantially equal mutual spacing therebetween, said row of brush pairs being arranged to extend transversely of the direction of conveyance of said planar objects whereby the brushes of said row cover the entire path of movement of said objects through said apparatus, means for rotating adjacent brushes located in said row on one side of said plane in opposite rotational directions, and means for introducing a solvent into at least some of said brushes and for spraying said solvent against said objects in the area thereof covered by said brushes.

3,946,455

CLEANING DEVICE FOR TUBES

Marvin Echols, 12021 Winwood, Houston, Tex. 77024, and Ralph H. Stockton, 4900 Palmetto St., Bellaire, Tex. 77401

Filed May 15, 1974, Ser. No. 470,265
Int. Cl.² B08B *9/04*
U.S. Cl. 15—104.06 R **2 Claims**

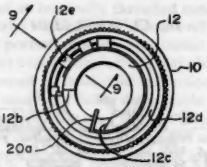


1. A cleaner device for heat exchanger tubes and the like comprising a casing member with a generally cylindrical outer wall and of yielding material and having a passage extending therethrough with spaced internal shoulders at an end of said passage forming a valve chamber and a check valve in said chamber, the terminal portions of said wall being more pliable than intermediate portions thereof to facilitate entry of the device into a tube when the device is oriented at an acute angle in relation to the mouth of a tube.

3,946,456
BATTERY TERMINAL CLEANER

George G. Martin, Kent, and Alvin J. Jones, Chesterland, both of Ohio, assignors to Milbar Corporation, Chagrin Falls, Ohio

Filed Mar. 13, 1974, Ser. No. 450,806
Int. Cl.² B23D 79/08
U.S. Cl. 15—105 10 Claims

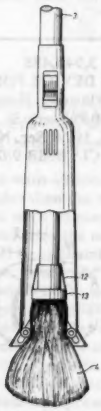


1. A tool of the class described comprising a housing, a scraper element disposed in the housing, said housing being formed with a mandrel and a scraper element being disposed partially around the mandrel, the wall of the housing being spaced from the mandrel and at least one projection extending from the wall into close proximity to the mandrel and one end of said scraper element being held by being disposed around the projection and the mandrel, said scraper element being of C shape and made of resilient metal, the mandrel having an axial opening defining a wall for disposal around a post, and being formed with a gap and said scraper element having a blade portion extending through said gap into said opening.

3,946,457
MOP WRINGER

Paul E. Robinson, Largs Bay, Australia, assignor to S.A. Brush Company Limited, Albert Park, Australia

Filed Sept. 18, 1974, Ser. No. 506,982
Claims priority, application Australia, Mar. 22, 1974, 6990/74
Int. Cl.² A47L 13/144
U.S. Cl. 15—119 R 4 Claims



1. A mop wringer comprising a flared, open ended tubular member having guide means adjacent its smaller end to guide the tubular member along the handle of the mop, and a pair of opposed substantially parallel rollers mounted in opposed guide slots in the tubular member, the slots being inclined to each other and situated at the larger end of the tubular member, the slots being more widely spaced from each other toward the larger end of the member whereby as the wringer is moved downwardly over the mop, the rollers engage the mop and due to the position of the slots the rollers move along the mop and automatically move along the slots to apply an increasing pressure to the mop.

3,946,458
APPARATUS FOR COLLECTING SURFACE LIQUIDS

Marven Creamer, and Adelene B. Creamer, both of 137 Palmer Ave., Mountain View, Calif. 94040

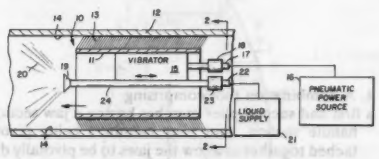
Continuation of Ser. No. 872,790, Aug. 22, 1969, abandoned, which is a division of Ser. No. 820,175, April 29, 1969, Pat. No. 3,562,846. This application Jan. 17, 1974, Ser. No. 434,452
Int. Cl.² A47L 7/00
U.S. Cl. 15—339 1 Claim

1. Apparatus for use in removing a liquid from a surface comprising: an assembly including a reservoir, an intake conduit, and means defining an exhaust conduit, said intake conduit having an open inlet and exteriorly of the reservoir and an open outlet end in fluid communication with said reservoir, the inlet end being disposed to permit liquid to enter the same by suction and to flow through said intake conduit when a flow of fluid is established therein, whereby liquid flowing through said intake conduit will exit therefrom through said outlet end and will enter the reservoir, said exhaust conduit being disposed to exhaust said fluid from the reservoir and adapted to be coupled to a vacuum source; means on said assembly for adjustably venting said reservoir to the atmosphere to thereby permit variations in the suction force at said inlet end; and a valve carried by said assembly for blocking said exhaust conduit against fluid flow therethrough when the fluid mass flow rate therethrough is above a predetermined volume.

3,946,459
SELF-PROPELLED PIPE CLEANER

Jack W. Armstrong, Baldwinsville, N.Y., assignor to Lipe Rollway Corporation, Syracuse, N.Y.

Filed July 19, 1974, Ser. No. 490,047
Int. Cl.² B08B 9/02
U.S. Cl. 15—377 7 Claims



1. A self-propelled pipe cleaner comprising:
a. a body having an axial extent shaped to conform to the inside of said pipe and to have a predetermined uniform clearance around said inside of said pipe;
b. pile material substantially covering said axial extent of said body and extending outward from said body far

enough to engage the inside of said pipe and support said body within said pipe;

c. said pile material having a multitude of resilient resin bristles of uniform length uniformly inclined from a plane transversely perpendicular to said axial extent of said body rearwardly relative to a forward direction of motion of said cleaner;

d. a vibrator mounted within said axial extent of said body; and

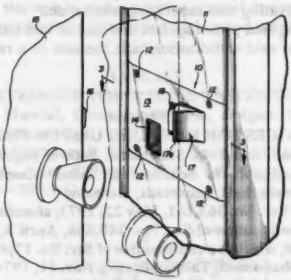
e. means for energizing said vibrator to vibrate said body reciprocally in the direction of said axial extent of said body so said bristles engaging said inside of said pipe move said cleaner in said forward direction through said pipe for cleaning said pipe.

3,946,460

RELEASABLE DOOR STOP AND STRIKE PLATE ASSEMBLY FOR A BIDIRECTIONAL SWINGING DOOR

Larry K. Johnson, Sterling, Ill., assignor to Lawrence Brothers, Inc., Sterling, Ill.

Filed May 21, 1974, Ser. No. 472,067
Int. Cl.² E05F *5/02*
U.S. Cl. 16—82 **8 Claims**



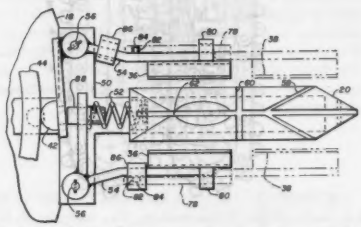
1. A door stop assembly for a bidirectional swinging door to permit opening of said door in a first direction during normal use while enabling selective opening of said door in a second direction during an emergency situation, said assembly comprising, in combination: a face plate adapted to be fastened to a doorway frame and having an aperture formed therein; housing means associated with said face plate in registry with said aperture for insertion into a mortise formed in a doorway frame, said housing means having an inner wall opposite said aperture in said face plate; a stop member movably carried within said housing means, said stop member being free from pivotal mounting on said housing means or said face plate, thereby constituting said stop member a free floating member, said free floating stop member having a first portion extending through said aperture of said face plate to provide a stop surface for a door being closed in the normal direction of movement, said first portion further including an inclined surface facing oppositely of said stop surface, and a second portion within said housing; means for maintaining said free floating stop member in assembly with said housing; biasing means positioned between said free floating stop member and said inner wall of said housing means to urge said first portion outwardly of said housing in blocking relation to said door; the surface of said second portion facing said inner housing wall being configured such that upon manual depression of said free floating member, said surface will first bottom on said inner housing wall, with said free floating stop member then rocking forward to dispose said stop surface entirely within said aperture, thereby permitting opening of said door in said second direction, said rocking movement positioning said inclined surface on said first portion at substantially the level of said aperture to preclude pinching the finger of the operator between said door and said aperture when said door is moved past said free floating stop member.

3,946,461

POULTRY BREAST SECTIONING MACHINE

Eugene G. Martin, Ephrata, Pa., assignor to Victor F. Weaver, Inc., New Holland, Pa.

Filed Jan. 6, 1975, Ser. No. 538,906
Int. Cl.² A22C *21/00*
U.S. Cl. 17—11 **7 Claims**



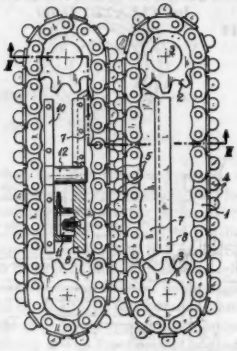
1. A machine for selectively sectioning the breasts of poultry into multiple pieces, said machine comprising in combination, a supporting frame structure having a loading station and a plurality of cutting stations and a discharge station, a horizontal supporting table mounted upon said frame for rotation about a vertical axis, a plurality of saddle members connected to said table at circumferentially spaced positions in position respectively for receiving at said loading station a poultry breast in a draped manner with the sides of said breast draped downwardly and automatically supported thereby for sequential indexing to said plurality of cutting stations, said saddle members each having a plurality of slots therein extending downward from the upper surfaces thereof and intersecting each other and corresponding to patterns of pieces into which said breasts may selectively be cut, said saddle members each having additionally affixed thereto a set of clamping members aligned with unslotted areas of said saddle members and respectively pivotally attached to each saddle member adjacent opposite sides thereof and mounted operably to engage said opposite draped sides of a breast and secure the same on said saddles during cutting operations, a cam fixed to said supporting frame, cam-followers on said clamping members engageable with said cam at said loading station to space said clamping members from said saddle members to permit mounting breasts thereon and said cam-followers disengaging said cam to permit movement of said clamping members against the draped sides of said breasts when said table moves toward said cutting stations, means engageable with said clamping members to move the same automatically as aforesaid, a plurality of angularly positioned rotatable knife blades respectively mounted above said table at said cutting stations circumferentially spaced about said vertical axis of said table and each supported and selectively operable sequentially and respectively for reciprocating movement toward and from one of said slots in said saddle members in selectable sequence with each other, and means operable sequentially to move said table to carry said saddle members in registry with said cutting stations respectively adjacent said knife blades, whereby a poultry breast thereby is automatically and accurately positioned for cutting into either halves or thirds or quarters.

3,946,462

IMPROVEMENTS INTRODUCED INTO MACHINES FOR BREAKING AND STRETCHING TEXTILE FIBERS

Antonio Lorenzo Garcia, Los Vascos No. 20, Madrid-3, Spain

Filed Mar. 22, 1974, Ser. No. 453,851
Claims priority, application Spain, Mar. 27, 1973, 413071
Int. Cl.² D01G *1/02*
U.S. Cl. 19—.41 1 Claim



1. A machine for breaking and stretching textile fibers comprising

at least one pressure head,

said pressure head including first and second chain assemblies each having at least two parallel shafts,

at least one endless transmission chain mounted for movement around said shafts in each of said chain assemblies,

first and second shoe means for supporting each of said chains with a run thereof in direct facing relation with a run of an opposite chain,

a fluid cylinder movably secured to one of said shoe means,

means supporting one of said shoe means in fixed relation to a facing shoe means supported for movement relative thereto from said cylinder,

each of said chains having pairs of links with interconnecting transverse cross members each having portions of substantially circular cross-section for contacting, intermeshing relation between a pair of said portions on cross members of the other chain providing a plurality of tangential lines intermeshing between said chains at the lines of contact of said portions whereby fibers traveling between said chains are engaged by said cross members moving linearly without rotation for subjecting said fiber to a variable meshing pressure at said tangential lines,

said portions of circular cross-section of said cross members have a diameter greater than the closest spacing between pairs of adjacent portions on each chain.

3,946,463

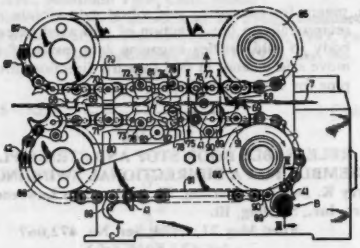
METHOD APPLYING THE FREE END OF A WITHDRAWING TAPE TO A TAMPON ROLL

Niels Warncke, Metzkausen, and Wolfgang Johst, Gevelsberg, both of Germany, assignors to Dr. Carl Hahn GmbH, Dusseldorf, Germany

Filed Oct. 19, 1973, Ser. No. 408,215
Claims priority, application Germany, Oct. 30, 1972, 2253180
Int. Cl.² A61L *15/00*
U.S. Cl. 19—144.5 6 Claims

1. In a method of applying the free end of a withdrawing tape to one end of a tampon batting roll, said withdrawing tape having its other end joined to said batting roll, the improvement which comprises:

aligning said batting roll with a withdrawing tape application station, said station including a cylinder coaxially aligned with said batting roll, said cylinder having a coaxially disposed piston therein, said piston having a plurality of apertures therethrough and asperating means for drawing air from the batting roll end of said cylinder through said apertures;



asperating said withdrawing tape into said cylinder and against said apertures of said piston in a random pattern by activating said asperating means; and

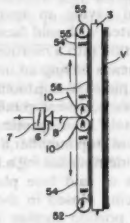
advancing said piston against said end of said batting roll to dispose said withdrawing tape thereon in a random pattern.

3,946,464

DEVICES FOR HANDLING UNSPUN FIBERS

Hans Meinke, and Fritz Schumann, both of Ingolstadt, Germany, assignors to Schubert & Salzer Maschinenfabrik Aktiengesellschaft, Ingolstadt, Germany

Division of Ser. No. 363,181, May 22, 1973, abandoned, which is a continuation of Ser. No. 240,836, April 3, 1972, abandoned, which is a continuation of Ser. No. 17,497, March 9, 1970, abandoned. This application Nov. 11, 1974, Ser. No. 522,699
Claims priority, application Germany, Mar. 12, 1969, 1912452
Int. Cl.² D01G *15/46*
U.S. Cl. 19—150 2 Claims



1. In a carding machine having a pair of driven transverse superposed delivery rollers for receiving a web of carded fibers, in open width in a receiving side of a nip formed between the rollers in alignment with the path of web delivery, for delivery from a delivery side of said nip toward sliver take up means, the improvement comprising a web controlling and sliver forming apparatus carried between said delivery rollers and said sliver take up means including:

A. a pair of transverse belts aligned in spaced end to end relation extending substantailly entirely across said web in open width;

B. each of said belts being carried on substantially vertical axes presenting a surface extending entirely across the

delivery side of said nip tangential to both rollers so that both belts are outside the nip;

C. means for supporting and driving each of said belts in opposite directions gathering said web inwardly from each edge and transporting and guiding the web to a medial portion thereof in a substantially tension free state;

D. said means for supporting and driving each of said belts including a pair of spaced aligned driven pulley rollers receiving said belts;

E. a sliver discharge passage formed between adjacent pulley rollers of each pair of pulley rollers by adjacent ends of said belts through which said gathered web is drawn as a sliver by said sliver take up means;

F. said sliver take up means including a trumpet and calender rolls positioned in alignment with said delivery rollers and said belts so that a path of said web extending to said delivery rollers and a path of said sliver being drawn through said sliver discharge passage are substantially in the same plane and substantially in the same direction;

G. pressing support means for maintaining said transverse belts in surface contact with said delivery rollers along substantially their entire length for avoiding buildup of fibers on said delivery rollers; and

H. means for maintaining said belts in longitudinal alignment on said driven pulley rollers;

whereby the web is under positive control during the sliver forming operation permitting high speed carding.

3,946,465

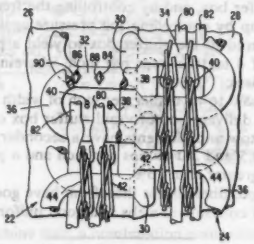
STRINGER FOR A SLIDE FASTENER

George B. Moertel, Conneautville, Pa., assignor to Textron Inc., Providence, R.I.

Filed Jan. 9, 1975, Ser. No. 539,615

Int. Cl.[2] A44B *19/12, 19/34*

U.S. Cl. 24—205.1 C **10 Claims**



1. A stringer for a slide fastener comprising

a tape-like attachment portion;

a coupling element disposed along one edge of the attachment portion and being formed from a continuous filament into successive sections;

each section having a head portion, a pair of elongated leg portions extending from opposite sides of the head portion, and a connecting portion interconnecting to a leg portion of an adjoining section;

thread means securing each section to the attachment portion;

a pair of elongated members spaced apart in a plane parallel the attachment portion and extending throughout the length of the coupling element between and transverse the pair of leg portions of each section for maintaining the pair of leg portions of each section in spaced relationship;

means securing at least one of said pair of leg portions of each section to the pair of elongated members for restraining longitudinal and transverse movement of the pair of leg portions relative to the pair of elongated members and for maintaining the pair of elongated members spaced apart; and

said pair of elongated members being dimensionally stable in their longitudinal dimensions whereby the one leg portions of the coupling element and the elongated members form a dimensionally stable mesh.

3,946,466

CLAMPING DEVICE FOR A PROTECTIVE DEVICE MOUNTED ON A SAFETY HEADGEAR

Yoshijiro Sakai, No. 35-65 Yamanishi,, Ninomiya, Naka, Kanagawa, Japan

Filed Sept. 12, 1974, Ser. No. 505,515

Int. Cl.[2] A44B *21/00;* **A41D** *13/00*

U.S. Cl. 24—243 B **3 Claims**

1. A clamping device for a protective device mounted on a headgear comprising:

a clamp member connected to said protective device and having an upper and lower portion;

a U-shaped receiving portion formed at the lower side of said clamp member for receiving the lower edge of said headgear;

at least one clamp screw provided on said clamp member opposite to said receiving portion so as to clamp said lower edge of said headgear between said at least one clamp screw and said receiving portion;

pivot means disposed upon said clamp member for pivotably supporting said protective device upon said headgear;

at least one additional clamp screw provided upon said clamp member within said upper portion of said clamp member and above said pivot means for abutting said headgear and thereby stabilizing the clamped connection established between said protective device and said headgear by means of said at least one clamp screw and said receiving portion;

a nose formed at the end of each of said clamp screws and enclosed with a convexly curved surface; and

a hollow presser loosely connected to each of said clamp screws and enclosing said nose portions.

3,946,467

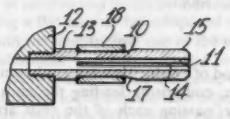
CLAMP FOR AN OPTICAL FIBRE

Helmut H. Lukas, Carleton Place, and Jack F. Dalgleish, Ottawa, both of Canada, assignors to Northern Electric Company, Limited, Montreal, Canada

Filed Dec. 9, 1974, Ser. No. 530,817

Int. Cl.[2] A44B *21/00;* **G02B** *5/14*

U.S. Cl. 24—260 **7 Claims**



1. A clamp for gripping a single optical fibre; comprising:

a tubular member having a bore therethrough of a diameter to receive a single coated optical fibre, and having a forward end and a rearward end;

said tubular member including a first external diameter at said forward end and a second external diameter remote from said forward end, said first diameter larger than said second diameter, and a tapered portion between said first and second diameters, said tapered portion connecting said first diameter to said second diameter;

therebeing a plurality of slits extending axially from said forward end to define a plurality of resilient cantilevered fingers;

a resilient sleeve on said tubular member, said sleeve having a bore which is a sliding fit on said second diameter of said tubular member and smaller in diameter than said first diameter of said tubular member, therebeing a slit extending axially the full length of said sleeve;

said resilient sleeve adapted to be moved axially on said tubular member over said tapered portion onto said first diameter to resiliently deform said cantilevered fingers into gripping relationship with said coated optical fibres, the sleeve also resiliently deformed to a larger diameter to provide a residual resilient force on said fingers after deformation of said fingers.

3,946,468

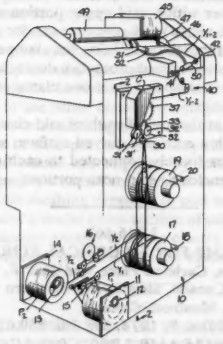
METHOD OF PRODUCING TEXTURED YARN

Fred B. Satterwhite, Williamsburg, Va., assignor to K. M. G. Machinery Limited, Macclesfield, England

Continuation-in-part of Ser. No. 532,642, March 8, 1966, Pat. No. 3,454,998, and Ser. No. 673,554, Oct. 9, 1967, abandoned, which is a continuation-in-part of Ser. No. 586,437, Oct. 13, 1966, abandoned. This application June 6, 1969, Ser. No. 831,111

Int. Cl.² D02G *1/20, 1/12*

U.S. Cl. 28—72.11 **5 Claims**



1. A method of producing a textured yarn from at least two ends of yarn, comprising leading the ends on the run to a heated roller, passing each of the ends around the roller a different number of turns thereby to heat the ends to different extents, and linearly compressing the differently heated ends in a common crimping chamber.

3,946,469

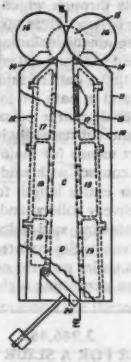
POLYESTER FIBERS AND TOWS

Richard W. H. Benson, Charlotte, N.C., assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 295,635, Oct. 6, 1972, abandoned, which is a continuation of Ser. No. 100,489, Dec. 21, 1970, abandoned, which is a continuation-in-part of Ser. No. 776,656, Nov. 18, 1968, abandoned. This application Nov. 8, 1973, Ser. No. 414,051

Int. Cl.² D02G *1/12*

U.S. Cl. 28—72.14 **2 Claims**



1. An improved process for preparing a tow of crimped filaments with each filament having a primary crimp and a secondary crimp in a plane substantially at right angles to the primary crimp, by feeding a tow of parallel filaments into a stuffer box crimper and heat setting with a fluid while the tow is in the stuffer box, and by controlling the frequency of the primary crimp by controlling the pressure against which the tow is delivered to the stuffer box to yield a primary crimp frequency of 4 to 10 crimps per inch, wherein the improvement comprises:

adjusting said tow's denier per inch of width at said tow's delivery point to said stuffer box crimper, until said tow and filaments have a secondary crimp of between 0.5 and 2.0 crimps per inch and a percentage crimp of greater than 15%,

whereby staple fibers made therefrom have good fiber openability, good cohesion in webs and good uniformity in yarns.

3,946,470

DOUBLE FLUSH RIVETING MACHINE

Charles L. Holland, Escondido, and Clarence P. Rolla, San Diego, both of Calif., assignors to General Dynamics Corporation, San Diego, Calif.

Filed Apr. 7, 1975, Ser. No. 566,020

Int. Cl.² B23B *11/00*

U.S. Cl. 29—34 B **14 Claims**

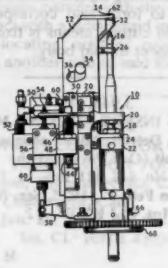
1. An accessory for use with an automatic riveting machine of the type wherein means are provided for forming a rivet receiving hole in a workpiece assembly, countersinking the upper surface around said receiving hole, and inserting a rivet in said receiving hole, said accessory comprising:

a countersinking means disposed in a first position below and in alignment with said receiving hole for countersinking the lower surface around said receiving hole;

an anvil disposed in a first position below said workpiece assembly in close proximity to said countersinking means; and

translating means for moving said countersinking means to a second position in clearance of said anvil, and translating said anvil into a second position in alignment with said rivet receiving hole for squeezing said rivet after insertion

in said receiving hole, whereby said riveting machine in use with said accessory permits countersinking the surface around the rivet receiving hole on both sides of the work piece and forming flush rivet heads on both sides thereof.



3,946,471

MEANS FOR MOVING RECIPROCABLE CARRIAGES FOR INDEXIBLE TOOL TURRETS IN MACHINE TOOLS

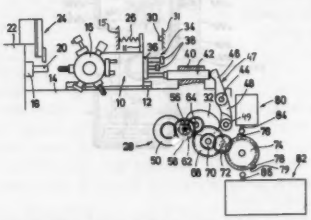
Helmut Link, Schanbach, Germany, assignor to Index-Werke KG Hahn & Tessky, Esslingen, Germany

Filed Sept. 12, 1974, Ser. No. 505,603

Claims priority, application Germany, Sept. 14, 1973, 2346369

Int. Cl.² B23B 7/04

U.S. Cl. 29—44 **20 Claims**



16. In a machine tool, a combination comprising a support, a carriage reciprocable along said support from a first position to one of a plurality of second positions; means for biasing said carriage to said first position; and apparatus for advancing said carriage to a selected second position, comprising a movable cam, follower means tracking said cam and arranged to move said carriage from said first position in response to movement of said cam from a starting position, a rotary fluid power motor operable at a plurality of speeds, means for moving said cam in response to rotation of said motor, a fluid-operated braking device for arresting said cam in a selected second position of said carriage, a programming device receiving motion from said motor and having a plurality of output elements, and regulating means including a plurality of mobile input elements each arranged to receive motion from a different one of said output elements in respective preselected positions of said programming device, each of said angular positions corresponding to a second position of said carriage, said regulating means further including first and second valves for respectively controlling the speed of said motor and the operation of said braking device, first displacing means movable in response to movement of any one of said input elements to thereby actuate said first valve so as to reduce the speed of said motor, second displacing means for actuating said second valve with a delay following the movement of any one of said input elements to thereby operate said braking device while said motor rotates at reduced speed, means for arresting said motor substantially simultaneously with operation of said braking devices, and fluid-operated resetting means for normally maintaining said valves in conditions corresponding to an elevated speed of said motor and inoperative condition of said braking device, said braking device comprising means for actuating said arresting means so that said arresting means stops said motor in response to operation of said braking device.

3,946,472

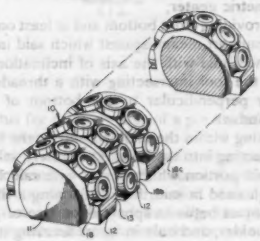
BROACHING TOOL

Sylvester Eugene Proulx, Windsor, and Stanley Alexander Beneteau, Tecumseh, both of, Calif., assignors to J. P. Tool Limited, Windsor, Canada

Filed Jan. 22, 1975, Ser. No. 543,172

Int. Cl.² B26D 1/04, 1/00, 1/12

U.S. Cl. 29—95.1 **13 Claims**



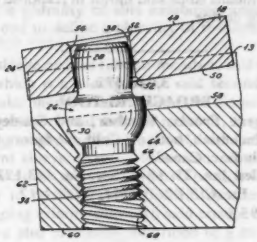
1. A broaching tool comprising an elongated tool body having a plurality of spaced ribs disposed generally transverse to the longitudinal body axis, each said rib defining an arcuate path of at least 45° with each succeeding rib having a larger diameter than the preceeding rib, a plurality of cylindrical cutter discs mounted along each rib, each disc having an end face providing a cutting edge disposed about the periphery of the end face, each disc being positioned with its end face disposed within 1°–15° of coincidence with the longitudinal axis of said body, the discs along each rib being staggered circumferentially with respect to the discs of the next adjacent rib such that the paths of successive cutter discs overlap, said discs being arranged to broach a hole having a radius at least three times the radius of the individual cutter discs, each disc projecting beyond the outer face of the rib and being rotatably indexable about its longitudinal axis to bring successive cutting portions into cutting position.

8. A broaching tool holder comprising a tool body having a plurality of spaced ribs disposed generally transverse to the longitudinal body axis, each said rib defining an arcuate path of at least 45° with each succeeding rib having a larger diameter than the preceeding rib, a plurality of sockets formed along each rib adapted to receive and retain cylindrical cutter discs, each socket having a flat bottom face disposed within 1°–15° of coincidence with the longitudinal axis of the tool body and an arcuate rear abutment wall perpendicular to said bottom face, the sockets along each rib being staggered circumferentially with respect to the sockets of the next adjacent rib such that the paths of successive sockets overlap, said sockets being arranged such that the holder with cutter discs retained in the sockets is adapted to broach a hole having a radius at least three times the radius of the individual cutter discs.

3,946,473
CUTTING TOOLS

Daniel R. Petersen, Livonia, Mich., assignor to Ex-Cello-O Corporation, Troy, Mich.

Filed Apr. 15, 1974, Ser. No. 461,065
Int. Cl.² B26D 1/00
U.S. Cl. 29—96 12 Claims

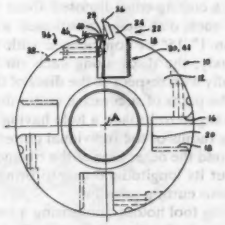


1. In a cutting tool
a. a disposable cutting insert having a hole substantially at the geometric center;
b. a body providing a flat bottom and at least one side which forms a support means against which said insert rests;
c. an inclined hole with the axis of inclination toward the front of the tool intersecting with a threaded hole substantially perpendicular to the bottom of the support means; and
d. a pin fitting within the inclined hole in the body with an end projecting into the hole of the insert, said pin having a spheroid portion which coacts with said inclined hole when tightened in said threads forming a tilting lock by point contact between spheroid portion of pin, inclined hole in holder, and hole in insert securing it in place.

3,946,474
ROTARY CUTTING HEAD

Norman Hahn, and Raymond G. Martin, both of East Earl, Pa., assignors to Conestoga Wood Products, Inc., East Earl, Pa.

Filed June 3, 1974, Ser. No. 475,515
Int. Cl.² B26D 1/28; B27G 13/04
U.S. Cl. 29—105 R 3 Claims

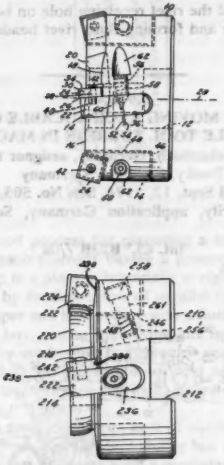


1. A rotary cutting head comprising, in combination, a cylindrical body rotatable about a longitudinal axis, a slot extending longitudinally along said body generally helically thereof, said slot having side walls, a plurality of serrations in one of said side walls, said serrations including a portion extending longitudinally outwardly of said wall to form a positive seating surface, cutting means in said slot, said cutting means having a first wall, a second inclined wall opposite said first wall and having a vertically extending groove therein and a plurality of serrations in said first wall corresponding to said serrations in said slot and cooperating therewith to seat said cutting means in said slot, and retaining means threadably adjustable with respect to said body, said retaining means extending through said side wall opposite said serrations into engagement with said vertically extending groove of said cutting means, said retaining means, inclined wall and vertical groove cooperating to force said corresponding serrations together whereby said cutting means is fixed both vertically and laterally with respect to said body.

3,946,475
CUTTING INSERT LOCKING MEANS

David Alan Hopkins, Detroit, Mich., assignor to The Valeron Corporation, Detroit (Oak Park), Mich.

Continuation of Ser. No. 441,021, Feb. 11, 1974, abandoned.
This application Feb. 27, 1975, Ser. No. 553,661
Int. Cl.² B26D 1/12
U.S. Cl. 29—105 R 17 Claims



1. An indexable polygonal insert cutting tool comprising;
a tool body,
said body having a pair of insert side locating surfaces,
a slot formed in said tool body adjacent said surfaces,
a bottom seat anvil in said slot projecting between said surfaces,
means to retain an insert on said anvil,
and locking means adapted to retain said anvil in said slot with an insert thereon in engagement with said side locating surfaces,
said locking means including means urging said anvil with a resultant line of force having a direction oblique to each of said surfaces and bottom seat to simultaneously forceably locate said insert relative thereto.

16. An indexable polygonal insert cutting tool comprising;
an annular tool body,
said body having a pair of insert side locating surfaces for each of a plurality of inserts,
a slot formed in said tool body for each of said inserts adjacent said surfaces,
a bottom seat anvil in each slot projecting between said surfaces,
means to retain an insert on each anvil,
and locking means adapted to retain each anvil in said slot with an insert thereon in engagement with said side locating surfaces,

said locating surfaces comprising surfaces of revolution integrally formed in said annular body and coaxial therewith,

one of said insert side locating surfaces being convexly curved in a plane parallel with the axis of revolution for central contact with a side of said insert, the other of said insert side locating surfaces providing for extended contact with another side of said insert.

3,946,476

AUTOMATIC MULTI-CONDUCTOR QUICK CONNECT TERMINATION TOOL

John Richard Mason, Thousand Oaks, Calif., assignor to Dracon Industries, Chatsworth, Calif.

Filed Jan. 22, 1975, Ser. No. 542,962
Int. Cl.² H01R *43/04*
U.S. Cl. 29—203 H **4 Claims**

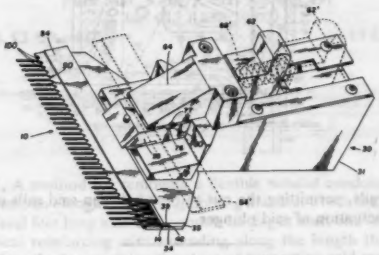
1. A multi-conductor termination tool for attaching electrical conductors in electrical contact with a pair of adjacent bifurcated electrical terminals on a multiple terminal block comprising a handle, an impact device in said handle for providing an impulse, an elongate member extending from said impact device for slidable motion with said handle, a termination head, an inner block in said termination head attached to one end of said elongate member, said inner block having a pair of slots therein adapted to receive the pair of adjacent electrical terminals, an outer jacket surrounding said inner block for slidable motion thereon and having an open end extended therefrom, said outer jacket having opposing straight and L-shaped slots aligned with each of said pair of slots in said inner block and extending to the open end of said jacket, said opposing slots being formed to accept the electrical conductors, so that when the electrical conductors are positioned in ones of said straight slots and through said opposing L-shaped slots, said impulse is transmitted through said elongated member to said inner block for cutting the electrical conductors on the side of the L-shaped slot, and for seating the electrical conductors in the adjacent pair of bifurcated terminals.

3,946,477

APPARATUS FOR ALIGNING AND INSERTING PINS INTO HOLES OF A SUBSTRATE

Robert Franklin Cobaugh, Elizabethtown, and James Ray Coller, Mechanicsburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 455,762, March 28, 1974, abandoned. This application June 24, 1975, Ser. No. 589,814
Int. Cl.² H05K *3/30*
U.S. Cl. 29—203 B **14 Claims**



1. Apparatus for inserting pins of a pin assembly into holes in a substrate comprising:

a pin assembly receiving member for engaging the pin assembly to transmit an insertion force thereto, and having a flat portion to underlie a portion of the pin assembly and constructed to support and align the pins;

a securing member having a surface adapted to contact and overlie a portion of the pin assembly to hold the pin assembly against said flat portion;

a base securely carrying said flat portion, and further carrying said securing member moveably between a position contacting said pin assembly and a position away from said pin assembly; and

means coacting between said base and said securing member for locking said securing member in said contacting position, and for releasing said securing member upon insertion of a predetermined length of the pins into the holes in the substrate.

3,946,478

FASTENER INSTALLATION HEAD

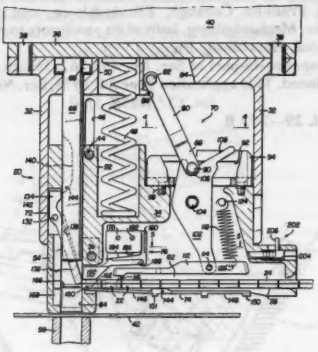
Dale H. Goodsmith, and Harold A. Ladouceur, both of Livonia, Mich., assignors to Multifastener Corporation, Detroit, Mich.

Filed May 5, 1975, Ser. No. 574,774
Int. Cl.² B23P *19/04*
U.S. Cl. 29—208 D **5 Claims**

1. In a fastener installation head having a nut passage for receiving a plurality of nuts aligned in side to side relation for installation by said head, a transverse plunger passage intersecting said nut passage and a plunger reciprocating within said plunger passage from a position above the intersection of said passage, through said passage intersection to install individual nuts received from said nut passage through said plunger passage, the improvement comprising:

a pair of parallel guide rails located within said plunger passage generally perpendicular to the reciprocating axis of said plunger and generally aligned with the nut supporting surface of said nut passage, the distance between said rails being slightly less than the width of said nuts measured across said nut passage, thereby supporting a nut within said plunger passage below said plunger and

resilient means adapted to permit said rails to be resilient spread when said plunger engages a nut supported on said



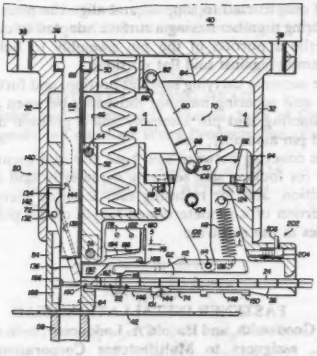
rails, permitting the nut to pass between said rails upon actuation of said plunger.

3,946,479

FASTENER INSTALLATION HEAD

Dale H. Goodsmith, and Harold A. Ladouceur, both of Livonia, Mich., assignors to Multifastener Corporation, Detroit, Mich.

Filed May 5, 1975, Ser. No. 574,777
Int. Cl.² B23P *19/04*
U.S. Cl. 29—208 D **8 Claims**



1. In a fastener installation head having a nut passage receiving nuts for installation, a plunger passage intersecting said nut passage, a plunger reciprocating in said plunger passage, a feed means feeding nuts from said nut passage to said plunger passage, beneath said plunger, following each stroke of the plunger and a stop means preventing nuts from entering the plunger passage except upon actuation of said feed means, the improvement comprising:

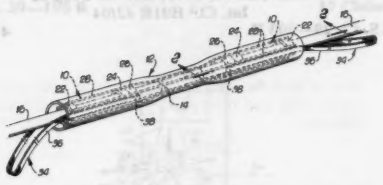
said stop means including two parallel cylindrical posts located on opposite sides of said nut passage at the intersection of said passages, said posts generally perpendicular to said nut passage and the distance between said posts being slightly less than the width of said nuts measured across said nut passage, said posts normally preventing nuts from entering said plunger passage and said posts each having resilient means adapted to permit said posts to be resilient spread and biased out of their restricting position upon a predetermined force applied to said nuts toward said plunger passage by said feed means, thereby preventing nuts from entering said plunger passage except upon actuation of said feed means.

3,946,480

APPARATUS FOR USE IN APPLYING AN EXPANDABLE RESILIENT SLEEVE TO A MEMBER THEREIN

Zoltan B. Dienes, Tarzana, Calif., assignor to Communications Technology Corporation, Los Angeles, Calif.

Filed Apr. 11, 1975, Ser. No. 567,236
Int. Cl.² B23P *19/02*
U.S. Cl. 29—235 **7 Claims**



1. In a device for maintaing a latrally expanded resilient sleeve, or the like, in a laterally expanded condition, and for progressively permitting the sleeve to contract onto a member therewithin, the sleeve to contract onto a member therewithin, the combination of:

a. a first, outer annulus positionable adjacent one end of the sleeve in alignment therewith;

b. a second, inner annulus aligned with said first annulus and positionable relative to the sleeve at a location spaced inwardly of the sleeve with respect to said one end of the sleeve;

c. a laterally contractible arrangement of longitudinal members carried by said first annulus and supported in a laterally expanded condition by engagement thereof with said second annulus and positionable within the sleeve;

d. said second annulus being movable toward said first annulus to permit said arrangement of longitudinal members to progressively contract laterally, thereby allowing the sleeve to progressively contract onto the member therewithin; and

e. actuating means connected to said second annulus for displacing it longitudinally toward said first annulus.

3,946,481

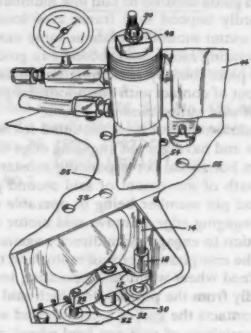
TAPER LOCK BOLT REMOVER

Roland J. Mulder, 1120 Morse Ave., Sacramento, Calif. 95825

Filed Mar. 28, 1975, Ser. No. 563,250
Int. Cl.² B23P *19/04*
U.S. Cl. 29—252 **4 Claims**

1. An apparatus for removing taper lock bolts from an aircraft wing, comprising: a lever arm; said lever arm including means at one end for applying a pushing force to said taper lock bolt; means for securing said lever arm to the aircraft wing at a position adjacent to said taper lock bolt; said means for securing said lever arm to said aircraft wing including means for providing a fulcrum for said lever arm; means for applying a pulling force to said lever arm on the side of said fulcrum remote from said means for applying a pushing force on said taper lock bolt; said means for applying a pulling force to said lever including a pull rod secured to said lever and means for applying a pulling force to said pull rod; said means for applying a pulling force to said pull rod including a hydraulic ram having a housing and a hydraulically movable cylinder positioned within said housing and around the pull rod; a hydraulic pump connected to said hydraulic ram for supplying

fluid under pressure to said hydraulic ram to move the cylinder with respect to the ram housing; means for applying the



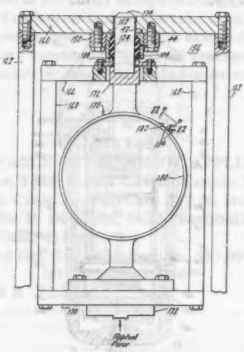
force from said ram housing to said aircraft wing structure and means for applying the force of said cylinder to said pull rod.

3,946,482

METHOD OF MANUFACTURING A WHEEL SPEED SENSOR

Jeffrey D. Marsh, and Gregg K. McPherson, both of Ann Arbor, Mich., assignors to Kelsey-Hayes Company, Romulus, Mich.

Division of Ser. No. 418,558, Nov. 23, 1973, Pat. No. 3,890,517. This application Mar. 12, 1975, Ser. No. 557,678
Int. Cl.² B23Q *17/00*
U.S. Cl. 29—404 **6 Claims**



1. A method for prestressing a resilient member to establish a predetermined resistance to relative motion between said resilient member and a related member which is adapted for a predetermined operative restrantive relationship with said resilient member comprising the steps of:

slidably moving said related member, or a simulation thereof, relative to said resilient member while said related member, or said simulation thereof, is in said operative restraintive relationship with said resilient member;

prestressing said resilient member in a manner so that the degree of prestressing of said resilient member is varied;

measuring the resistance to said relative motion between said related member, or said simulation thereof, and said resilient member while the degree of prestressing is varied; and

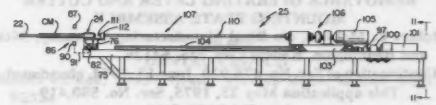
maintaining the degree of prestressing when said predetermined resistance to said relative motion is attained.

3,946,483

APPARATUS FOR AND METHOD OF REMOVING A FLEXIBLE TUBULAR CONDUIT FROM AROUND AN ASSOCIATED ELONGATED RIGID SUPPORTING MANDREL

Homer N. Holden, Sylva; James P. Hunt, Clyde; Vernon D. Browning, Waynesville; Edward L. Hoglen, Candler, all of N.C., and Donald L. Kleykamp, Springboro, Ohio, assignors to Dayco Corporation, Dayton, Ohio

Filed Mar. 5, 1975, Ser. No. 555,491
Int. Cl.² B23P *19/02*
U.S. Cl. 29—427 **17 Claims**



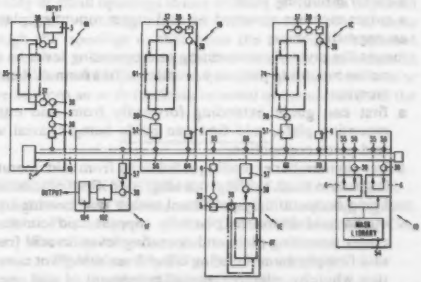
1. A method for removing a flexible tubular conduit from around an elongated rigid supporting mandrel which is at least several feet long with said conduit having at least one integral helical reinforcing wire extending along the length thereof, said method comprising the steps of supporting said mandrel and its conduit on a support structure, holding an end portion of said conduit in a stationary position, and simultaneously rotating and moving said mandrel during holding of said conduit in said stationary position to remove said mandrel from within said conduit, said rotation of said mandrel being in a direction opposite the direction of rotation of said helical reinforcing wire causing radial expansion of said conduit relative to said mandrel enabling easier moving of said mandrel from within said conduit.

3,946,484

CONTINUOUS PROCESSING SYSTEM

Jesse Aronstein, and William E. Harding, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 329,920, Feb. 5, 1973, Pat. No. 3,889,355. This application May 1, 1975, Ser. No. 573,632
Int. Cl.² B01J *17/00*
U.S. Cl. 29—569 R **16 Claims**



1. A manufacturing system for processing semiconductor substrates comprising:

A. a plurality of processing stations having loading and unloading positions, each of said stations having means for performing different fixed processing operations on said substrates,

B. a conveyor means for transporting individual ones of said substrates between and at any one of said work stations;

C. means for transferring said individual ones of said substrates between said conveyor and said stations at their said loading and unloading positions;

D. control means for said conveyor and transfer means for routing said substrates individually between any prescribed sequence of said stations for a corresponding prescribed series of processing operations, wherein

E. said stations comprise means for performing a plurality of semiconductor processing operations from the group of epitaxial growth, metallization, photoresist pattern exposure, impurity diffusion, impurity drive-in, photoresist development, oxide etching, metal etching, photoresist stripping, formation of dielectric coatings, sputtering, ion implantations and photoresist coating operations.

3,946,485

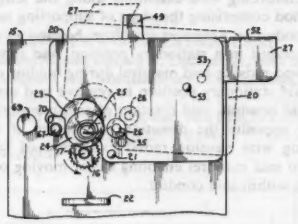
POWER OPERATED CAN OPENER WITH POWER-PIERCE, AUTOMATIC SHUTOFF, AND REMOVABLE OPERATING LEVER AND CUTTER MOUNTING PLATE ASSEMBLY

Robert E. McLean, c/o Rival Manufacturing Company, 36th and Bennington, Kansas City, Mo. 64129

Continuation of Ser. No. 478,920, June 13, 1974, abandoned. This application May 23, 1975, Ser. No. 580,419

Int. Cl.² B67B 7/38

U.S. Cl. 30—4 R **2 Claims**



1. In a power operated can opener, the combination of:

an upright frame having a bearing opening therein;

a can feed wheel rotatably supported on said frame;

a motor drivingly connected with said can feed wheel;

a switch connected with said motor, said switch having a motor energized condition and a motor deenergized condition;

a cutter mounting plate;

a cutter member mounted on said cutter mounting plate;

an operating lever;

means for pivotally connecting said operating lever to said cutter mounting plate at a location offset from said cutter member;

a first can guide extending forwardly from said cutter mounting plate, said first can guide being coaxial with said pivot connection;

a first pin member extending rearwardly from said operating lever into said bearing opening, said first pin member being cooperatingly positional within said bearing opening in said frame to pivotally support said connected cutter mounting plate and operating lever on said frame, said first pin member being offset from said pivot connection whereby selective pivotal movement of said operating lever with respect to said frame effects movement of said cutter mounting plate throughout an operating range of the latter;

a second pin member extending rearwardly from said cutter mounting plate at a location thereon to move in a path inclined substantially from horizontal upon movement of said cutter mounting plate;

a second opening in said frame, said second pin member extending through said second opening when said connected cutter mounting plate and operating lever are supported on said frame;

a link member pivotally supported on said frame;

means for biasing said link member in a preselected pivotal direction;

a second can guide secured to said link member and extending forwardly beyond said frame at a location remote from said cutter mounting plate as same moves throughout its operating range, said second can guide and cutter mounting plate thereby remaining completely disassociated and out of contact with one another regardless of the position of said cutter mounting plate;

an integral motor control lever mounted for movement on said frame and having a pin engaging edge oriented at an angle from horizontal corresponding substantially to said inclined path of movement of said second pin member, said second pin member being in operable contact with said pin engaging edge to move said motor control lever in a direction to engage same directly against said switch to cause the energization of said motor and the driving of said can feed wheel when said operating lever is moved downwardly from the position in which said cutter member first contacts the end of a can inserted with its flange over the periphery of said can feed wheel; and

a latch, said latch releasably engaging said first pin member through said bearing opening to hold said connected cutter mounting plate and operating lever at a position near said frame, and said latch being movable to allow disengagement from said first pin member and axial separation of said first pin member and said bearing opening.

3,946,486

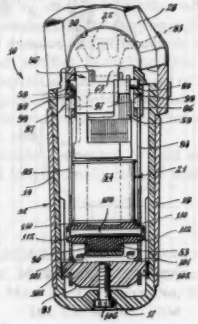
PORTABLE ELECTRICAL SHAVER WITH PIVOTALLY MOUNTED MOTOR

David R. Locke, Bridgeport, and Edward Szymansky, Fairfield, both of Conn., assignors to Sperry Rand Corporation, Bridgeport, Conn.

Filed June 12, 1974, Ser. No. 478,714

Int. Cl.² B26B 19/28; H02K 5/24, 5/04

U.S. Cl. 30—43.92 **10 Claims**



1. In a portable electrical appliance,

a. a casing,

b. a shroud assembly disposed adjacent one end of the casing,

c. a motor assembly having a stator and a pivotally mounted armature for driving an output means,

d. means suspending the motor assembly from the shroud assembly, said suspending means providing a pivot for the motor assembly, the motor assembly moves about the pivot in an arcuate path upon energization of the motor assembly,

e. a block assembly disposed adjacent the other end of the casing and secured thereto,

f. means interconnecting the block assembly to the shroud assembly, and

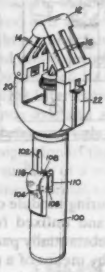
g. dampening means engaging said interconnecting means to dampen said arcuate movement of the motor assembly in the operation of the motor assembly.

3,946,487

TOOLS FOR CUTTING

Zdzislaw Bieganski, Brushwood, Kingsbourne Green, Harpenden, Hertfordshire, England

Filed Apr. 1, 1974, Ser. No. 456,666
Claims priority, application United Kingdom, Aug. 6, 1973, 37165/73; Apr. 26, 1973, 19923/73
Int. Cl.² B21F 13/00
U.S. Cl. 30—90.7 16 Claims



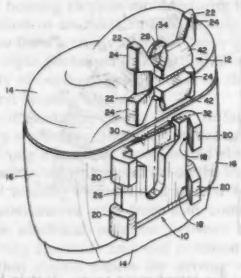
1. A tool for cutting the sheath of a cable or the like, comprising a loop-like frame including at least two parts hinged together and catch means releasably holding them in closed loop form, a handle extending away from the loop, a cutter which is adjustable in position inwardly and outwardly of the loop, the position of the cutter being controlled by pin and slot means, a pair of rollers carried on a bracket which is displaceable with said cutter, and a body which houses the cutter and which has a screw connection with said bracket by means of which said bracket is adjustable relative to said body and cutter.

3,946,488

REMOVABLE ORTHODONTIC APPLIANCE

Frank R. Miller, 1381 N. San Gabriel Canyon Road, Azusa, Calif. 91702; Craig A. Andreiko, 517 N. Holliston, Pasadena, and John H. Di Giulio, 5623 Marshburn Ave., Arcadia, both of Calif. 91106

Filed Oct. 25, 1974, Ser. No. 517,999
Int. Cl.² A61C 7/00
U.S. Cl. 32—14 B 10 Claims



1. Orthodontic appliance comprising:

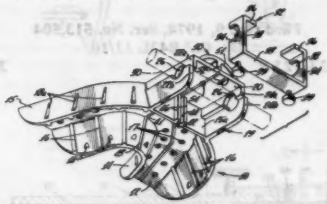
a pedestal member adapted to be secured to a tooth;
a bracket member;
one of said members having a slide way;
the other of said members having a slide selectively receivable in said slide way, whereby said bracket member may be selectively applied to and removed from the tooth without removing said pedestal member;
a detent edge formed on a first one of said members;
an elongate locking member formed from a second one of said members, at least one end of said locking member being integrally joined to said second one of said members, the intermediate portion of said locking member being free of said second one of said members, so that it is free to flex as said members are slid together, and then drop over said edge, thereby to lock said members together.

3,946,489

DENTAL CLUTCH

Robert L. Lee, 22937 Grand Terrace Road, Colton, Calif. 92324

Filed Dec. 30, 1974, Ser. No. 537,576
Int. Cl.² A61C 9/00
U.S. Cl. 32—17 22 Claims



1. A dental clutch comprising a member shaped to fit over the teeth of a human jaw including a horizontal wall to extend adjacent the crowns of the teeth and inner and outer side walls to fit over the sides of the teeth, said member being sized to permit a quantity of bonding material to fit around the teeth for securing the member to the teeth, said member having a plurality of small openings in one or more of its walls to permit some of said bonding material while in soft form to ooze through the openings so that when the material is hardened said member is securely attached to the teeth; and means in said member which permit it to be readily broken into two or more sections so as to facilitate removal of the clutch from the teeth.

3,946,490

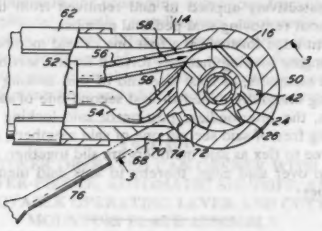
LUBRICATION SYSTEM FOR DENTAL HANDPIECE

Kurt Sotman, Penn Wynne, and Richard P. Lewis, Springfield, both of Pa., assignors to Star Dental Manufacturing Co., Inc., West Conshohocken, Pa.

Filed Mar. 27, 1974, Ser. No. 455,456
Int. Cl.² A61C 1/08
U.S. Cl. 32—28 2 Claims

1. A dental handpiece comprising a handle and a turbine housing mounted on one end thereof, a rotor mounted within said turbine housing, said rotor being rotatably mounted in bearings, said bearings comprising upper and lower bearings, with said rotor being mounted between said upper and lower bearings, a port formed in said handle, said port being in fluid communication with the interior of said turbine housing, said port comprising a channel formed in said handpiece, said channel having an opening in said turbine housing, said opening being positioned between said upper and lower bearings,

and a collar secured on said handle and slidable relative thereto, said collar being adapted to cover said port, whereby



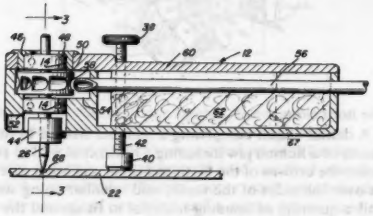
a lubricant can be injected through said port into the interior of said turbine housing.

3,946,491

PNEUMATIC ENGRAVING TOOL

Russell O. Bailey, Sarasota, and William S. Stone, Longboat Key, both of Fla., assignors to S-P Products, Inc., Sarasota, Fla.

Filed Oct. 9, 1974, Ser. No. 513,504
Int. Cl.² B43L *13/10*
U.S. Cl. 33—23 R **3 Claims**



1. A fluid actuated, portable engraving tool, comprising, in combination:

a. a body provided with an opening;

b. a tracing assembly mounted on the body and arranged for engaging in a suitable template; and

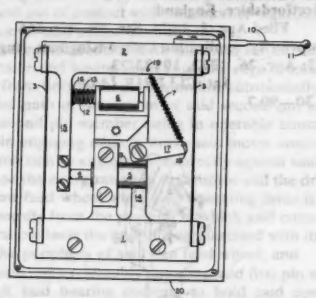
c. a unitized fluid motor assembly arrangeable in the opening of the body, said motor assembly including, a spindle, an engraving means attached to said spindle, a motor cap, a bearing affixed onto the spindle for rotation therewith and received in a recess provided in the motor cap, a fluted rotor affixed to the spindle, and a further bearing affixed to the spindle and arranged bracketing the rotor in cooperation with the bearing, a cavity provided in the body and arranged in communication with the opening of the body for forming a chamber receiving the rotor, a tube entering the body and terminating at an interface between the rotor and the chamber receiving the rotor, the tube providing a passage for injecting a fluid under pressure and impinging same on a fluted circumference of the rotor, and the body member is further provided with a labyrinth, a short partition dividing the labyrinth so as to cause a reversebend of the exhaust fluid flow, and a foamed material arranged in the labyrinth for exerting a back pressure on the fluid under pressure and forcing a lubricant carried in the fluid under pressure to be forced into the bearing and further bearing.

3,946,492

DIMENSION MEASURING MODULE

Reagan L. DuBose, Jr., Andover, Mass., assignor to Hycor, Incorporated, Woburn, Mass.

Filed Mar. 14, 1974, Ser. No. 451,136
Int. Cl.² G01B *7/28*
U.S. Cl. 33—169 R **7 Claims**



1. In a dimension measuring module of the class comprising a fixed frame member, and unfixed frame member spaced from and maintained in substantially parallel relationship with the fixed frame member by means of a pair of parallel spaced apart leaf springs connected therebetween and transducer means in operative communications with the unfixed frame member, the improvement which comprises, in combination:

A. means acting upon the unfixed frame member to continuously urge the unfixed frame member forwardly to a measuring position;

B. means in communication with and acting upon the unfixed frame member to overcome the forwardly directed action of the means of (A) and to resiliently urge the unfixed frame member rearwardly to a nonmeasuring position; and

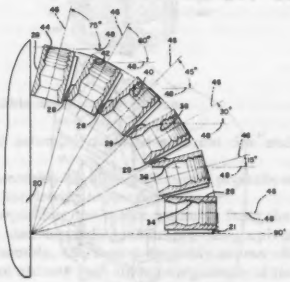
C. means to disengage, on command, the means of (B) from communication with the unfixed frame member, thereby to allow forward displacement of the unfixed frame member under the influence of the means of (A).

3,946,493

DRILL SIGHT FOR AN ELECTRIC HAND DRILL

John J. Torres, 2869 Ford, Oakland, Calif. 94601

Filed June 6, 1974, Ser. No. 476,779
Int. Cl.² G01C *1/00, 15/00;* B23B *45/14*
U.S. Cl. 33—263 **8 Claims**



1. A drill sight for attachment to an electric hand drill to determine an angle of drilling relative to a surface of a workpiece the drill sight comprising:

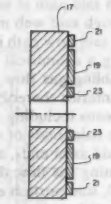
a. a support structure having means for attaching said support structure to a top portion of an electric hand drill having a defined axis of drilling;
b. a sight member with first and second ends, said sight member having:
1. means cooperating with said support structure for mounting said sight member to said support structure;
2. means for forming a first reference axis parallel to the axis of drilling of the electric hand drill;
3. means for locating a reference point on the first reference axis substantially at the first end of the sight member;
4. means for forming at least one second reference axis parallel to and proximately spaced from said first reference axis; and,
5. a plurality of discrete indicia markings located on the second reference axis between said first and second ends of said sight member, each indicia marking having a predetermined angle designation, wherein each indicia marking is so located on the second reference axis that a line of sight intersecting the reference point on the first reference axis and a selected indicia marking on the second reference axis orients the axis of drilling at the angle designation of the selected indicia marking relative to the surface of a workpiece when the line of sight is maintained normal to the surface of the workpiece.

3,946,494

TOROIDAL ELECTROLYTIC ANGLE TRANSDUCER

Perry L. Wells, Loveland, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sept. 30, 1974, Ser. No. 510,662
Int. Cl.² G01C 9/06
U.S. Cl. 33—366 **7 Claims**



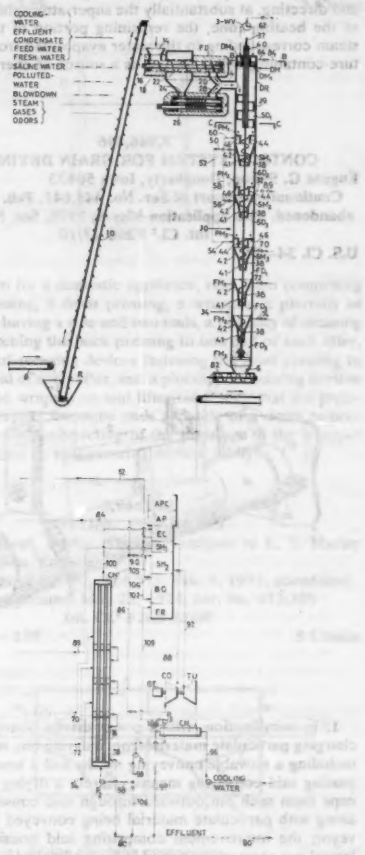
1. A toroidal electrolyte-type angle transducer comprising:
a first housing element;
a second housing element mounted with an inner surface in opposition to an inner surface of said first housing element to form a cavity therebetween;
an electrolyte contained in a portion of said cavity;
a plurality of conducting electrodes on the inner surface of said first housing element;
a common electrode on the inner surface of said second housing element in electrical contact with said plurality of conducting electrodes through said electrolyte;
at least one guard-ring electrode on the inner surface of said second housing element and spaced apart and substantially coextensive with from said common electrode to provide electrical isolation between said at least one guard-ring electrode and said common electrode; and
equalization circuit means for driving said at least one guard-ring electrode at the same electrical potential as the potential of said common electrode to prevent the flow of current therebetween.

3,946,495

METHOD AND APPARATUS FOR DRYING MOISTURE-CONTAINING SOLIDS PARTICULARLY DOMESTIC REFUSE AND SLUDGE CAKES

Asriel Osdor, 36 Tzireison St., Tel Aviv, Israel

Filed Dec. 19, 1973, Ser. No. 426,247
Int. Cl.² F26B 5/04
U.S. Cl. 34—15 **23 Claims**



1. A method of using moisture-containing solids, such as domestic refuse and sludge cakes, to produce dried residue and nearly saturated steam at super atmospheric pressure, comprising: introducing the moisture containing solids into the top of a vertical vessel containing a heating zone at super-atmospheric pressure, the vessel serving as a direct contact pressurized boiler and the moisture-containing solids serving as the feed-water and flowing downwardly therein: introducing superheated steam into a lower part of the heating zone to flow upwardly in counter-current direct contact with the down-moving moisture-containing solids, the bulk of the moisture contained in the moisture-containing solids being vaporized in said heating zone; removing from the upper end of the heating zone a nearly saturated steam at a considerably lower temperature and at a slightly lower pressure than the temperature and pressure of said introduced superheated steam, said removed steam including the water vapor evaporated from the moisture-containing solids by the heat of cooling of said intro-

duced superheated steam; reheating and slightly compressing a quantity of the removed steam equal to the quantity of the introduced superheated steam and recycling same through the heating zone in counter-current flow to the downmoving moisture-containing solids; directing the partially dried residue leaving the heating zone to move downwardly through a flashing zone maintained at lower pressure than the heating zone, additional moisture from the moisture-containing solids being vaporized by flashing; removing the dried solid residue; and directing, at substantially the super-atmospheric pressure of the heating zone, the remaining portion of the removed steam corresponding to the water evaporated from the moisture-containing solids for use as a source of energy.

3,946,496

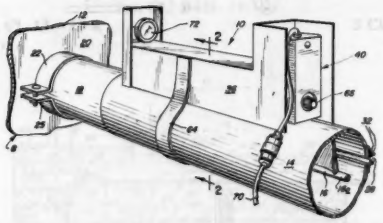
CONTROL SYSTEM FOR GRAIN DRYING BIN

Eugene G. Sukup, Dougherty, Iowa 50433

Continuation-in-part of Ser. No. 445,641, Feb. 25, 1974, abandoned. This application May 5, 1975, Ser. No. 574,831

Int. Cl.² F26B *13/10*

U.S. Cl. 34—56 **10 Claims**



1. In combination with a power-driven conveyor for discharging particulate material from a drying bin, said conveyor including a movable conveying means and a housing encompassing said conveying means wherein a drying gas may escape from such bin outward through said conveyor housing along with particulate material being conveyed by said conveyor; the improvement comprising said housing having a lateral gas passage positioned to be external to said bin, apparatus for controlling the operation of such conveyor including a control unit having actuating means including an element which is responsive to a condition of a gas therearound, said element being positioned externally of said conveyor housing and adjacent said lateral passage, a second housing covering said element and cooperating with said conveyor housing portion adjacent said lateral passage to form an enclosure for said element which is essentially impervious to passage of gas except for communication with the interior of said conveyor housing through said lateral passage, and means for essentially isolating such enclosure and said element therein from ambient atmospheric temperature conditions, whereby the control operation of said control unit is effected by the condition of the gases from said conveyor housing circulating into said second housing through said gas passage and independently of ambient temperatures of the atmosphere; said control unit being connected to control the power drive of said conveyor in accordance with predetermined conditions of such gas sensed by said element in said enclosure.

3,946,497

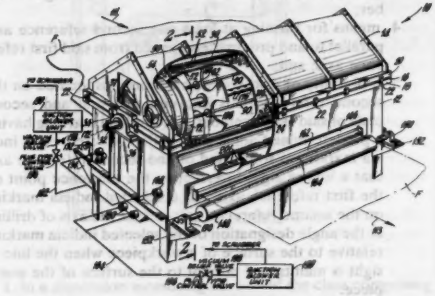
APPARATUS FOR TREATING TEXTILE FABRIC TO RETARD INFLAMMABILITY

William Carter, Greenville, S.C., assignor to United Merchants and Manufacturers, Inc., New York, N.Y.

Filed Jan. 15, 1973, Ser. No. 323,655

Int. Cl. F26b *13/30*

U.S. Cl. 34—92 **19 Claims**



1. Apparatus for treating a continuous length of web material with a gas comprising:

a substantially gas-tight treatment chamber;

means defining a flow path for said gas through said treatment chamber;

means for continuously passing said web material across said gas flow path at a treatment location within said chamber; and

means for constraining substantially the entire amount of said gas flowing in said path at said treatment location to flow directly through said web material;

said means defining said flow path including a hollow cylindrical shell having a cylindrical wall with orifice means therethrough enabling gas flow outwardly of said shell from the hollow interior thereof;

said constraining means including

means sealing the axial ends of said shell to prevent gas flow through said axial ends, and

means for preventing gas flow through a portion of said cylindrical shell, said portion extending partially about the circumferential perimeter of said shell and completely across the length of said shell between said axial ends sealing means.

3,946,498

PORTABLE HAIR DRYER

Robert S. Waters, Lancaster, and Edward J. Doyle, Hatboro, both of Pa., assignors to Schick Incorporated, Lancaster, Pa.

Filed July 31, 1974, Ser. No. 493,705

Int. Cl.³ A45D *20/24*

U.S. Cl. 34—99 **21 Claims**

1. A portable hair dryer comprising, in combination:

a flexible bonnet adapted to fit over the head of a user for distributing air onto a hair surface to be dried, said bonnet having an inlet at one end for receiving heated air under pressure;

a combination blower and heater power module having a housing and an outlet in said housing for supplying heated air under pressure;

support means including a pair of straps adapted to extend over the shoulders of the user and join in front of the user for supporting said combination blower and heater power module against the back of the user whereby said outlet

is positioned adjacent to said inlet; and

means for joining said outlet and said inlet to form a substantially airtight passageway between said power module and said bonnet for supplying heated air to said bonnet.

3,946,499

HEATED DRYER DRUM FOR PAPER MACHINES AND THE LIKE

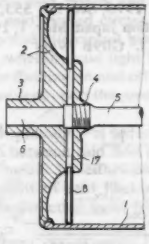
Christian Schiel, Heidenheim-Schnaitheim, Germany, assignor to J. M. Voith, GmbH, Heidenheim (Brenz), Germany

Filed Nov. 21, 1974, Ser. No. 525,734

Claims priority, application Germany, Dec. 13, 1973, 2361973

Int. Cl.² F26B *25/00*

U.S. Cl. 34—124 **16 Claims**



1. A heated dryer drum, especially for a paper machine comprising; a closed cylindrical shell, end members connected to opposite ends of said shell, each end member engaging the axial end surface and the radially inner surface of the respective end of the cylindrical shell, journal means connected to said end members in the center and projecting axially outwardly therefrom for rotatably supporting said drum, and tie rod means inside said shell extending axially between and engaging said end members near the centers of the end members, said tie rod means adapted for being placed in tension thereby to draw said end members into prestressed load transmitting relation with said shell, said end members being axially resilient, each said end member gradually increasing in thickness in the radially inward direction, and being about four times as thick in the axial direction in the center as it is near the periphery, said tie rod means engaging said end members in the axially thickest regions thereof.

3,946,500

TUMBLER DRUM FOR A DOMESTIC APPLIANCE

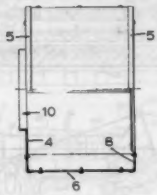
Colin Barrett, Halifax, and Peter Cash, Brighouse, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 28, 1974, Ser. No. 473,889

Claims priority, application United Kingdom, June 14, 1973, 28337/73

Int. Cl.² F26B *11/02*

U.S. Cl. 34—139 **3 Claims**



1. A drum for a domestic appliance, said drum comprising a back pressing, a front pressing, a wrapper, a plurality of lifters each having a side and two ends, a plurality of securing devices fastening the back pressing to one end of each lifter, a plurality of securing devices fastening the front pressing to the other end of each lifter, and a plurality of securing devices fastening the wrapper to said lifter sides such that the pressings and wrapper from the ends and side of a drum respectively, structural connection of the pressings to the wrapper being provided by said securing devices solely.

3,946,501

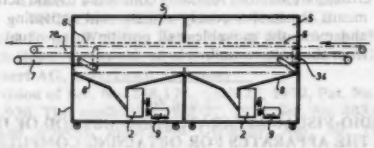
DRYING APPARATUS

Jeffrey Cotterell, Purley, England, assignor to E. T. Marler Ltd., London, England

Continuation of Ser. No. 224,675, Feb. 9, 1972, abandoned. This application May 22, 1974, Ser. No. 472,309

Int. Cl.² F26B *13/00*

U.S. Cl. 34—155 **5 Claims**



1. An air jet drying machine comprising

a fixed plenum chamber including in a wall thereof one or more apertures,

means for supporting an article to be dried adjacent the plenum chamber,

means for issuing air from the aperture or apertures to impinge upon such article,

a fixed exhaust chamber positioned to receive air after it has issued from the plenum chamber and has impinged on said article,

said support means comprising an endless conveyor belt wherein both runs are positioned between the plenum chamber and the exhaust chamber,

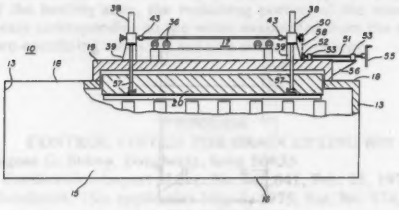
said fixed exhaust chamber including exhaust means for maintaining a pressure differential across said conveyor to hold articles on said conveyor, and

means for moving said conveyor belt towards or away from said plenum chamber to vary the distance therebetween and thus vary the velocity at which air impinges upon the article supported on said conveyor belt.

3,946,502
PARISON OVEN HAVING ADJUSTABLE CEILING

Robert A. Daane, Rockton, Ill.; Edward D. Beachler; Raymond C. Vonderau, both of Beloit, Wis., and Nickolas N. Sokolow, Roscoe, Ill., assignors to Beloit Corporation, Beloit, Wis.

Filed Aug. 16, 1974, Ser. No. 498,080
Int. Cl.² F26B *19/00*
U.S. Cl. 34—231 **1 Claim**



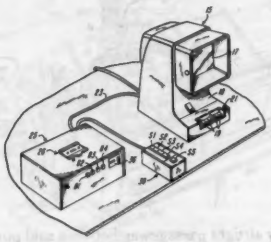
1. An oven for heating thermoplastic parisons of various lengths, said oven including:
- a ceiling wall, a bottom wall, and four side walls cooperatively defining a heating zone;
- a high pressure plenum structure being defined on one of said side walls;
- means to supply heating fluid to said plenum structure and into said heating zone;
- said ceiling wall being adjacent to said high pressure plenum structure defined on one of said walls;
- said ceiling wall including a cover portion and a movable wall portion;
- means to activate said wall portion to increase and decrease the flow path of the heating fluid;
- said activating means maintaining said movable wall portion equally spaced from said bottom wall;
- said activating means being mounted to said cover portion;
- said activating means being equally spaced from the bottom wall of the oven and including rod members secured to the movable wall portion;
- said rod members maintaining the movable wall portion at an equal height from said bottom wall; and
- a cross shaft member rotatably connected to said activating means to simultaneously actuate said activating means and move the movable wall portion to an equal height from the bottom wall.

3,946,503
AUDIO-VISUAL APPARATUS AND METHOD OF USING THE APPARATUS FOR OBTAINING COMPUTER COMPATIBLE DATA FROM AN INDIVIDUAL

Robert R. C. Buchan, Troy, and Robert W. Kirchgessner, Jr., Dayton, both of Ohio, assignors to Robert R. C. Buchan, Troy, Ohio

Filed Mar. 20, 1974, Ser. No. 452,976
Int. Cl.² G09B *7/08*
U.S. Cl. 35—9 A **6 Claims**

1. In apparatus for presenting a series of questions and corresponding multiple choice answers in incremental sequence to an individual and for recording his selected answer, and comprising an audio-visual unit including a magnetic tape player, a magnetic tape on said tape player and having a prerecorded audio program, said audio-visual unit further including a screen and a visual program incorporating a series of written questions and corresponding multiple choice answers for projecting onto the screen, the visual program being controlled by a series of electrical signals prerecorded on the magnetic tape which carries the audio program, means for producing an electrical pulse signal corresponding to each question presented, signal generating means for producing different electrical pulse signals corresponding to the multiple choice answers, the pulse signals for the answers also being different from the pulse signal for each question, and control means connected to operate said signal generating means to provide for selecting an answer and to produce a corresponding electrical pulse signal for the selected answer, the improvement comprising a magnetic tape recorder unit separate from said tape player and connected to record the pulse signal corresponding to the presentation of each question and the pulse signal generated in response to the selection of an answer, means for automatically and momentarily starting said

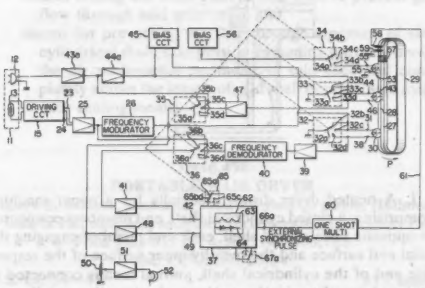


tape recorder unit in response to the presentation of each question on said audio-visual unit and in response to the selection of an answer to effect recording of the corresponding pulse signals, time delay means for momentarily delaying the recording of each pulse signal until after said tape recorder unit is started, and means for automatically stopping said tape recorder unit immediately after each signal is recorded to produce a magnetic tape record of condensed different electrical pulse signals corresponding to the questions and selected answers.

3,946,504
UTTERANCE TRAINING MACHINE

Toyomichi Nakano, Hiroshima, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 26, 1975, Ser. No. 553,286
Claims priority, application Japan, Mar. 1, 1974, 49-23945
Int. Cl.² G09B *19/04*
U.S. Cl. 35—35 C **12 Claims**



1. An utterance training machine comprising:
- flow speed detector means for converting the flow speed of expiration into an electrical signal to provide a flow speed signal;
- acoustic-electric converter means for converting a voice into an electrical signal to provide a speech signal;
- an endless recording medium for recording and retaining thereon said speech signal and said flow speed signal;
- record-reproduce means for causing said speech and flow speed signals to be recorded on said endless recording

medium and for reproducing said recorded signals from said endless recording medium;

set means for setting said record-reproduce means to record mode or reproduce mode; and

display means for receiving said flow speed and speech signals provided from said endless recording medium to display the waveforms of said signals on a screen when said record-reproduce means is set to the reproduce mode by said set means.

3,946,505

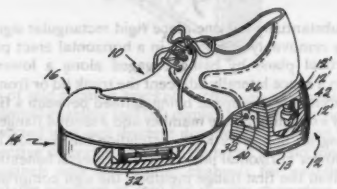
SHOE WITH DETACHABLE ILLUMINATED HEEL

Alfred Dana, III, 5700 Mariner, Apt. 306-W, Tampa, Fla. 33609

Continuation-in-part of Ser. No. 493,610, July 31, 1974. This application Oct. 4, 1974, Ser. No. 512,304

Int. Cl.² A43B *00/00*

U.S. Cl. 36—2.5 K **8 Claims**



1. A shoe comprising

a. a shoe upper,

b. a sole,

c. a transparent heel, said heel having formed therein a first cavity receiving a source of e.m.f. and a second cavity receiving an electrical assembly, said electrical assembly comprising a light bulb mounted on a printed circuit board and circuits on said board for providing electrical connection of a source of e.m.f. mounted in said first cavity to said light bulb, a three-position electrical switch mounted on said board and disposed in the circuits formed on said printed circuit board, and a mercury tilt switch disposed in a circuit between said switch and said light bulb, whereby said light bulb may be off, continuously on, or flashing on and off in response to heel movement, dependent upon the position of said three-position switch,

d. means for providing a secure but readily detachable connection between said heel and said upper, and

e. releasable means for either preventing or allowing relative movement of said heel with respect to said shoe upper in the direction away from said sole.

3,946,506

TRIMMER TYPE ROAD CONSTRUCTION APPARATUS WITH PIVOTALLY CONNECTED CONVEYOR

Ralph K. Snow, Jr., Oklahoma City; Warren W. Grist, Yukon, and Joe Bill Kruger, Oklahoma City, all of Okla., assignors to CMI Corporation, Oklahoma City, Okla.

Division of Ser. No. 225,936, Feb. 14, 1972, Pat. No. 3,802,525. This application Sept. 27, 1973, Ser. No. 401,374

Int. Cl.² E02F *3/76*

U.S. Cl. 37—108 R **6 Claims**

1. A road construction apparatus, comprising:

a main frame having a forward end, a rearward end, a left side, and a right side;

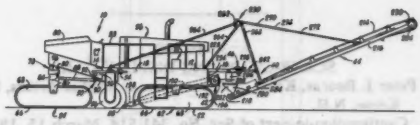
drive means connected to the main frame, drivingly moving the main frame;

a moldboard connected to the main frame, excavatingly engaging a portion of the earth;

a base conveyor connected to the main frame, having one end portion disposed near the moldboard and one end portion disposed near the rearward end of the main frame, receiving a portion of the earth excavated via the moldboard and moving the excavated earth deposited thereon generally toward the rearward end of the main frame, wherein the base conveyor extends generally between the left side and the right side of the main frame, and angularly generally from the forward end toward the rearward end of the main frame, the base conveyor including:

a latching flange connected to the end portion of the base conveyor disposed near the moldboard, having a portion latchingly disposed over a portion of the main frame;

a locking pin secured through a portion of the main frame, generally above the latching flange, securing the latching flange in an assembled position;



a removal pin removably connecting the end portion of the base conveyor disposed near the rearward end of the main frame, to the main frame; and

a jack flange connected to the underside of the base conveyor for engaging the earth and forming a pivoting base for pivotally disengaging the latching flange from the main frame upon removal of the locking pin and the removal pin and the lowering of the end portion of the base conveyor disposed near the rearward end of the main frame;

an elevated conveyor pivotally connected to the main frame, having a portion receiving the excavated earth from the base conveyor and depositing the excavated earth at predetermined positions; and

means connected to the elevated conveyor, supporting and pivotally moving the elevated conveyor in a predetermined swing path.

3,946,507

LABEL FOR USE ON CONTAINERS FOR PHOTOGRAPHIC FILM OR THE LIKE

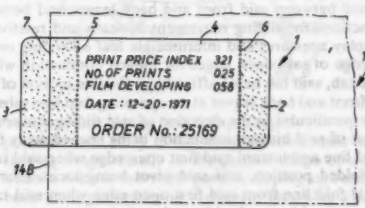
Berthold Fergg; Wolfgang Zahn, both of Munich, and Friedrich Hujer, Grunwald, all of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Germany

Division of Ser. No. 248,126, April 27, 1972, Pat. No. 3,841,936. This application June 27, 1974, Ser. No. 483,670

Claims priority, application Germany, Apr. 30, 1971, 2121499

Int. Cl.² A44C *3/00*

U.S. Cl. 40—2 R **8 Claims**



1. The combination of an envelope having an open end, particularly for insertion of photographic film and/or prints, with a label having a first side and a second side and comprising a first portion including two spaced-apart sections each provided with a coat of adhesive at one side of the label, said

label further comprising a second portion disposed between and separating said sections for each other, said second portion having information applied thereto so that such information is observable at the other side of the label and said second portion being non-adherent at said one side of the label, said label also comprising weakened portions disposed between said second portion and said sections to facilitate the separation of said second portion from said sections and a fold line provided in at least one of said sections and dividing said one section into first and second parts, said one section being folded along said fold line so that said first and second parts overlap each other and the adhesive coat of said one section is located between said parts, said parts adhering to said envelope at the opposite sides of said open end so that said one section at least partially closes said open end, the other of said sections also adhering to said envelope.

3,946,508

SCENE-CHANGING DISPLAY CARD

Peter J. Booras, Keene, N.H., assignor to Yankee Artists, Inc., Keene, N.H.

Continuation-in-part of Ser. No. 341,518, March 15, 1973, abandoned. This application June 5, 1975, Ser. No. 584,032

Int. Cl.² G09F *1/00*

U.S. Cl. 40—124.1 **13 Claims**

1. A display-changing multilayer display device which comprises a front leaf and a back leaf joined together along two spaced and substantially opposite junctions of substantial length to form a flat envelope having two open edges on opposite ends thereof, at least one display aperture in at least one of said front and back leaves, an intermediate leaf slidably positioned between said front and back leaves and between said junctions for sliding movement beneath and relative to said display aperture, said intermediate leaf extending out of a first edge of said open edges for hinged connection with a foldable tab, said tab being affixed to a flexible section of one of said front and back leaves at an operating fold line substantially perpendicular to the direction of said sliding movement, the pivot of said hinged connection being spaced away from said fold line and toward said first open edge when said tab is in the folded position, and said pivot being located farther than said fold line from said first open edge when said tab is in the open position, and said envelope being open at a second edge of said open edges to accommodate extension of said intermediate leaf at its free end when said tab is in the folded position, whereby said intermediate leaf is shifted by the opening of said tab to present a different display area of said intermediate leaf than the display area initially visible through said display aperture.

3,946,509

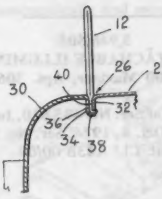
TEMPORARY SIGN FOR AUTOMOBILES

David McCaffrey, Toronto, Canada, assignor to Gravure-Craft Ltd., Toronto, Canada

Filed Aug. 15, 1974, Ser. No. 497,556

Int. Cl.² G09F *21/04*

U.S. Cl. 40—129 C **1 Claim**



1. A substantially flat one piece rigid rectangular sign to be manually removably positioned in a horizontal erect position in a vertical plane by being engaged along a lower edge thereof in a space laterally adjacent the trunk lid or front hood of an automobile, the space being defined between a first flat vertically extending flange member and a second flange member having an upper vertically extending flat portion and an integral lower horizontal portion which extends beneath but is spaced from the first flange member, the sign comprising:

a. a pair of flat rectangular panels;

b. a rectangular resilient panel sandwiched between the pair of flat panels; and

c. a flexible vinyl covering shaped to smoothly enclose the cardboard panels and to extend downward from the cardboard panels to the lower edge of the sign, whereby the sign has a resilient main body portion ⅛ to ⅜ inches in thickness and a flexible narrow thinner lower edge portion formed by the vinyl covering,

engagement of the sign in the space being by downward insertion of the lower edge of the sign into the space to the erect position in which a lower portion of the main body portion is resiliently engaged between the first flange member and the upper portion of the second flange member, and the lower edge portion is bent by contact with the lower portion of the second flange member to a position partially beneath the first flange member.

3,946,510

CHANGEABLE CHARACTER-SYMBOL SYSTEM

Wilfried Schubert, Lake Elmo, Minn., assignor to National Advertising Company, Bedford Park, Ill.

Filed Aug. 12, 1974, Ser. No. 496,640

Int. Cl.² G09F *7/10*

U.S. Cl. 40—140 **3 Claims**

1. A changeable copyboard display for flat display characters bearing oriental language characters, said changeable copyboard display comprising:

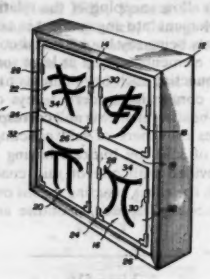
a frame including a copyboard background;

a plurality of discrete display positions on said copyboard background, each of said discrete display positions including,

a pair of transparent side channel members mounted on said copyboard background at opposite sides of said display position, each of said transparent channel members including a longitudinal channel for receiving one of said display characters, and

a pair of transparent bottom corner retainer brackets mounted on said copyboard background at opposite corners of said display position for retaining and restraining said flat display character from substantial movement on said copyboard;

means for mounting said transparent paired side channel members and said transparent paired bottom corner retainer brackets to define said plurality of discrete display positions in a series of vertically aligned columns on said copyboard background for reading said oriental characters from the right bottom most position upwardly and from bottom to top continuing to the top left most display position;



each of said retainer brackets including an L-shaped corner channel enabling said flat display characters to be slidably inserted into said discrete display position; and

respective convex surfaces at each end of said longitudinal channels and said corner channels for enabling ready slidable insertion of said flat display characters into said side channel members and said corner retainer brackets at said discrete display positions.

3,946,511

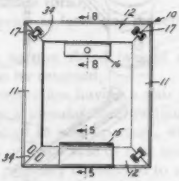
RESILIENT PICTURE FRAME CONSTRUCTION

Samuel G. Wiener, Jr., 2 River Lane, Westport, Conn. 06880

Filed Oct. 23, 1974, Ser. No. 517,082

Int. Cl.² G09F 1/12

U.S. Cl. 40—152.1 **1 Claim**



1. In a picture frame construction including a plurality of interconnected peripheral frame elements, each frame element defining a longitudinally oriented resilient clamping means, at least one planar panel having edge portions thereof positioned between said clamping means of each of said plurality of frame elements to thereby maintain said frame elements in mutually coplanar relation, the improvement comprising: said clamping means including a longitudinal main wall, and first and second oppositely disposed resilient members; said first resilient member being of curvilinear cross section, and having a free edge facing said second resilient member; said second resilient member including a first planar portion, a second planar portion in co-planar relationship relative to said first planar portion, and a recess-forming portion disposed between said first and second planar portions and opposite said free edge of said first resilient member; whereby engagement of said clamping means with said planar panel is facilitated by the insertion of an edge of said panel into said recess-forming portion at an angle relative to the plane of said first and second planar portions of said second resilient member, and subsequently aligning and contacting said panel with said first and second planar portions on one surface of said panel, while contacting said free edge of said first resilient member on another surface of said panel.

3,946,512

SLOTTED TURN-A-FRAME

Marilyn R. Shapiro, 3327 Ripple Road, Baltimore, Md. 21207

Filed Jan. 2, 1975, Ser. No. 538,180

Int. Cl.² G09F 1/12

U.S. Cl. 40—152.1 **5 Claims**

1. A reversible frame assembly mountable to bracket means on a vertical wall surface, comprising:

an outer frame having an inner surface, the outer frame being provided with a pair of spaced slots formed in the inner surface of said outer frame;

an inner frame secured to the inner surface of the outer frame between the spaced slots, the inner frame having opposite faces; and,

viewing material secured to each of the opposite faces of the inner frame, the spaced slots in the inner surface of the outer frame mounting the frame assembly to the bracket means disposed on said vertical wall surface, each one of the slots alternatively mounting the frame assembly on disposition of the given slot in facing relation to said vertical wall surface.

3,946,513

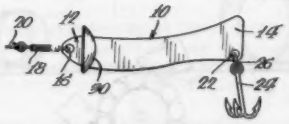
FISHING LURE

Seliga, Gerald W., Frankfort, Ill., assignor to G & S Industries, Inc., Oak Forest, Ill.

Filed Dec. 20, 1974, Ser. No. 534,872

Int. Cl.² A01K 85/00

U.S. Cl. 43—42.5 **17 Claims**



1. A subsurface fishing lure comprising:

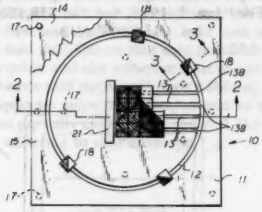
a generally oval body of flat sheet material, said body extending longitudinally in the general shape of a fish silhouette with a rearward portion sloping upwardly, said body having a head with means for attaching a line, and a tail with means for attaching a hook; and

a dish-shaped disc transversely mounted on said head with its concave side facing the forward end of said body, said disc being positioned on said body whereby the upper portion of the tail is above the turbulent flow of water caused by the interaction of the disc and water as the lure is drawn through the water by a line attached to the head.

3,946,514
MOSAIC BLOCK TOY

John Joslyn, Bayview Ave., Sag Harbor, L.I., N.Y. 11963

Filed Oct. 4, 1974, Ser. No. 511,997
Int. Cl.² A63H *33/10*
U.S. Cl. 46—1 R 1 Claim

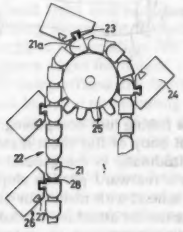


1. A mosaic block toy comprising:
a base member,
means defining an endless groove formed in said base member,
a plurality of passways directly connected in communication with said endless groove, whereby the directly connected passways are parallel one another,
each of said passways having a dead end,
a backstop disposed adjacent the dead end of said passways,
a plurality of mosaic blocks, said back stop and blocks having complementary edge portions to insure initial orientation of said blocks,
means connected to said blocks for containing said blocks confined to said endless groove and connected passways whereby said blocks can be shifted and rotated within both said groove and passways as they are moved along said groove and passways for changing the orientation of said blocks with respect to one another therein,
indicia means formed on the surfaces of said blocks whereby said blocks may be positioned along said passways in a predetermined order whereby the indicia thereon combine to define a predetermined overall design.

3,946,515
CHAIN HAVING DETACHABLE LINKS AND BUCKETS

Artur Fischer, Altheimer Strasse 219, D-7241 Tumlingen, Germany

Filed Mar. 19, 1974, Ser. No. 452,998
Claims priority, application Germany, Mar. 23, 1973, 7311025; Apr. 10, 1973, 7313486
Int. Cl.² A63H *33/08*
U.S. Cl. 46—17 10 Claims

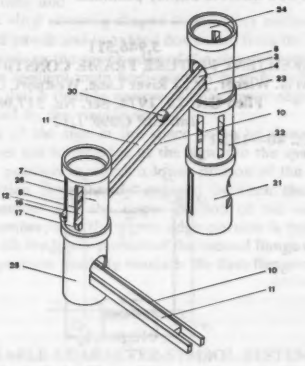


1. In a toy, a combination comprising a plurality of chain elements pivotally connectable to each other, each of said chain elements being a link having wall means including first side wall portions at one end of said respective chain elements relatively close together and having second side wall portions at the other end more widely spaced apart, each chain element including a relatively short rod integrally interconnecting the relatively close first side wall portions and a relatively long rod integrally interconnecting the more widely spaced second side wall portions, means readily detachably connecting adjacent ones of said chain elements comprising a bore extending along and through the relatively short rod and a slot extending along and opening from said bore, said slot forming a restricted opening so as to allow snapping of the relatively long rod of a further chain element into engagement in said bore; a plurality of toy elements being toy buckets; and coacting means on each of said toy elements and on at least some of said chain elements for connecting such toy elements to such chain, said coacting means comprising undercut keys on some of said coacting-means-bearing elements and correspondingly shaped undercut grooves on others of said coacting-means-bearing elements, each of said toy buckets having several surfaces respectively provided with one of said coacting means for cooperation with the other coacting means on said chain, two of said surfaces being disposed at obtuse angles to one another.

3,946,516
MODULAR MARBLE GAME

Peter Wirth, Bachtelstrasse 18, 8340 Hinwil, Switzerland

Filed Dec. 24, 1974, Ser. No. 536,238
Claims priority, application Switzerland, Dec. 27, 1973, 18267/73
Int. Cl.² A63H *33/06*
U.S. Cl. 46—17 5 Claims



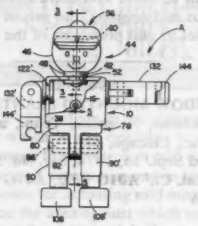
1. Apparatus for playing games with marbles comprising:
a plurality of first modular members, each said first modular member being a hollow cylindrical section having ends of unequal diameter such that the outer diameter of the smaller end is equal to the inner diameter of the larger end, whereby a plurality of modular members may be securely stacked,
said first modular member being provided with an opening in the side of said section, said opening comprising an upper circular portion and a lower rectangular portion,
said first modular member also having two vertical slots placed in its surface opposite said opening whereby the vertical plane of symmetry between the two slots passes through the vertical axis of the member and through the vertical plane of symmetry of said opening; and
a plurality of channel-shaped second modular members, wherein the sides of said channel extend beyond the bottom of the channel at each end of the member to form two prongs at each end of said channel-shaped member, said prongs are adapted to securely fit into the slots of said first modular member when said channel-shaped

second modular member is inserted into said rectangular portion of said lateral opening in said first modular member.

3,946,517
ANIMAL CHARACTERIZATION FIGURES WITH ARTICULATABLE BODY COMPONENTS

Adolph E. Goldfarb, Tarzana; Erwin Benkoe, Encino; Delmar K. Everitt, Woodland Hills; Ronald F. Chesley, La Crescenta, and Richard D. Frierdich, Canoga Park, all of Calif., assignors to Adolph E. Goldfarb, Tarzana and Erwin Benkoe, Encino, both of, Calif.

Filed Feb. 13, 1975, Ser. No. 549,826
Int. Cl.² A63H *3/16*
U.S. Cl. 46—21 **7 Claims**



1. A toy figure for preschool children with extremities connected to a body of said figure to resist unauthorized removal by said preschool children, said figure comprising:

a. a first torso section formed of a rigid material,

b. a second torso section formed of a rigid material,

c. said torso sections having abutting margins to be secured together to form a torso,

d. said torso having at least one extremity retaining aperture,

e. a connector section fitted in said aperture where an extremity is to be retained,

f. said connector section having a pair of opposed flanges connected by a circular intermediate recessed portion sized to be fitted in said aperture, with one of said opposed flanges on each side of said aperture, and

g. an extremity pivotally connected to and extending from said connector section, in such manner that said connector section can be pivoted in said aperture in a first plane relative to said torso and said extremity can be pivoted on said connector section in a second plane relative to said torso,

said first and second planes being substantially mutually perpendicular, with said first plane being relatively parallel to a transverse dimension of said torso,

said torso being provided with a second extremity retaining aperture, a second connector section for retention within said second aperture for pivotal movement in said first plane, and a second extremity connected to said second connector section for pivotal movement in said second plane,

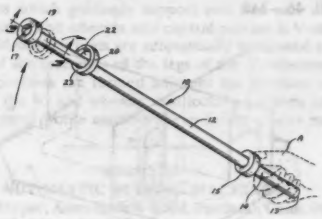
said first and second apertures being located on opposite sides of said torso, said first and second connector sections forming shoulder joints, and said first and second extremities comprising arms,

a slot being formed in said torso, a pelvic section having an outwardly extending locking element extending through said slot and being retentively retained in said torso when said torso sections are secured together for non-pivotal movement with respect to said torso.

3,946,518
TOY STICK AMUSEMENT DEVICE

Howard M. Ylitalo, Rte. 2, Box 101, Cokato, Minn. 55321

Filed Nov. 11, 1974, Ser. No. 522,512
Int. Cl.² A63H *1/32*
U.S. Cl. 46—47 **1 Claim**



1. A toy stick device comprising

an elongated stick member,

a ring member having a small wall thickness having an arcuate outer surface in cross-section and having a flat inner wall surface in cross-section, said ring member having a bore of a diameter of sufficient size to provide a free twirling movement of said ring about said stick,

a resilient substantially spherical stop member at one end of said stick, said member being sufficiently resilient for a rebound of said ring member from said stop member upon engagement therewith,

an annular collar forming a stop member secured about said stick spaced from the other end thereof and being of like resilience as said first mentioned stop member,

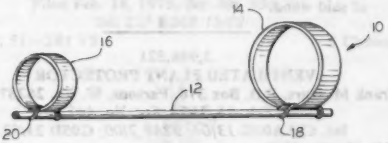
a handle formed on said stick between said collar and the adjacent end of said stick, and

said stick and the bore of said ring having non-slick engaging surfaces.

3,946,519
METHOD AND APPARATUS FOR CONSTRUCTING A TOSS-TYPE FLYING DEVICE

George Vadik, and Maury Balkan, both of Chicago, Ill., assignors to Marketing Techniques, Inc., Chicago, Ill.

Filed Aug. 2, 1974, Ser. No. 494,322
Int. Cl.² A63H *27/00*
U.S. Cl. 46—79 **8 Claims**



1. A toss-type flying apparatus comprising:

a longitudinally extending cylindrical fuselage member;

a first circular formed aerodynamic member removably affixed to one end of said fuselage member;

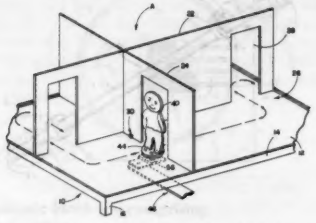
a second circular formed aerodynamic member removably affixed to the other end of said fuselage member;

said first and second aerodynamic members each affixed to said cylindrical fuselage member by looping a rubber band around said fuselage, extending said rubber band over a portion of said member, and looping said rubber band around said fuselage on the other side of said member.

3,946,520
MAGNETIC DOLL SET WITH THIN SUBSTRATE SUPPORTED BY A FRAME AND BY WALLS THEREON

Adolph E. Goldfarb, 4614 Monarca Drive, Tarzana, Calif. 91356, and Erwin Benkoe, 17965 Medley Drive, Encino, Calif. 91316

Filed Feb. 10, 1975, Ser. No. 548,829
Int. Cl.² A63H *33/26*
U.S. Cl. 46—240 4 Claims



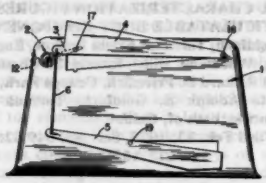
1. A magnetically operable play doll set comprising:
a. a frame,
b. a substrate formed of a relatively thin material located on and being partially supported directly by said frame and having a surface permitting a doll to be movable thereon,
c. at least one wall supported by said frame, said wall extending across said substrate in generally perpendicular relation thereto, and dividing said substrate into a plurality of room areas,
d. said substrate being formed with a thickness such that it is not totally self-supporting on said frame, and said wall being formed of a thickness so that it is self-supporting on said frame in its upright position,
e. means operatively securing said substrate to said wall intermediate of spaced sides of said frame so that said substrate is partially suspended from said wall,
f. a doll movable on said substrate movable between a plurality of said room areas on said substrate,
g. first magnetic means operatively mounted with said doll,
h. a wand having a portion locatable under said floor,
i. a pivotally mounted extension on said wand locatable in magnetically coupling relationship to said first magnetic means,
j. second magnetic means mounted on said extension and being movable therewith, whereby said extension and second magnetic means will pivot on said wand to become aligned with the direction of movement of said wand to orient said doll to face the direction of movement of said wand.

3,946,521
VENTILATED PLANT PROTECTOR

Frank M. Ours, P.O. Box 370, Parsons, W. Va. 26287

Filed Feb. 13, 1974, Ser. No. 442,151
Int. Cl.² A01G *13/04*; F24F *7/00*; G05D *23/02*
U.S. Cl. 47—28 R 1 Claim

1. A plant protector comprising a housing adapted to substantially enclose a plant or group of plants to be protected, an elongated ventilation opening in a wall of said housing, an elongated panel extending adjacently along said opening and having one end pivotally mounted on said housing wall to turn about a pivot axis at one end of said opening, said panel pivotally moving in a plane parallel to said housing wall between a position closing said opening and at least one other position selectively uncovering said opening, means for controlling the position of said panel comprising a thermally responsive device mounted within the housing so as to be subject to the air temperature within the housing, said device comprising an expansible heat sensitive coil having one end anchored on said housing wall, the other of said coil attached to a pivot pin extending between said housing wall and a bracket thereon, a motion transmitting control arm secured at one end to the pivot pin and pivotally connected at its other end to the other end of said panel adjacent the other end of said opening

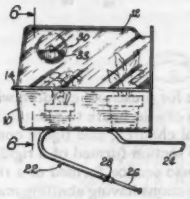


whereby a variation in air temperature within the housing may actuate said coil to move said control arm for pivoting said panel relative to said opening, the axis of the coil being substantially parallel to said pivot axis of the panel.

3,946,522
WINDOW MOUNTED PLANTER BOX

Edward J. Schifman, Nashville, Tenn., assignor to Aladdin Industries, Inc., Chicago, Ill.

Filed Sept. 16, 1974, Ser. No. 506,561
Int. Cl.² A01G *9/02*; A47G *7/00*
U.S. Cl. 47—36 9 Claims



1. A planter box for mounting in a window frame of a room comprising:
a drawer for supporting plants therein, said drawer having a plurality of ribs on its bottom;
a bottom shell having a bottom surface and a plurality of sides, said bottom shell being open at one side to slidingly receive said drawer therein, the bottom of said bottom shell having a ribbed construction matching the ribs of the drawer bottom whereby said drawer ribs nest in the bottom shell ribs to guide the entry and removal of said drawer from said bottom shell;
a top shell of transparent material having a top and a plurality of sides, said top shell being open at one side thereof corresponding to the open side of said bottom shell and supported on said bottom shell to form said planter box; and
means for mounting said box in a position extending substantially out of said window frame with said open sides communicating the interior of said planter box with the environment of said room to moderate the temperature in said planter box while permitting substantial amounts of sunlight to reach said plants.

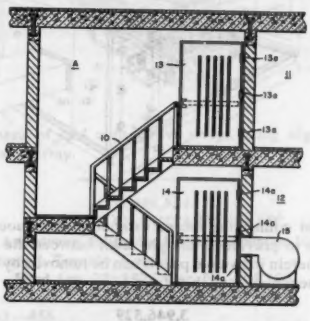
3,946,523
DEVICE FOR ASSISTING THE OPENING OF A DOOR

Thomas Hebda, 235 Vance, Lombard, Ill. 60148

Filed Aug. 8, 1974, Ser. No. 495,663
Int. Cl.² E06B *7/02*
U.S. Cl. 49—38 6 Claims

1. In a system for facilitating the escape of personnel from an area in which fire may exist, a chamber which is connected

with said area by a doorway, a door which is hingedly mounted adjacent said doorway and normally closes said doorway, said door being movable into said chamber to open the doorway, said door having a releasable latch normally holding said door in closed position, means for bringing said chamber under elevated air pressure, said door having an air passage which



extends from one side of the door to the other side, means for closing said passage which is also operable to open said passage to provide a passage for air through said door, means for unlatching said door, and means responsive to the operation of said unlatching means for actuating said means for opening said passage to reduce the area against which said elevated air pressure is applied and so assist in the opening of said door.

3,946,524

BLIND FRAME AND SASH CONSTRUCTIONS FOR SASH WINDOWS, SLIDING DOORS, AND THE LIKE

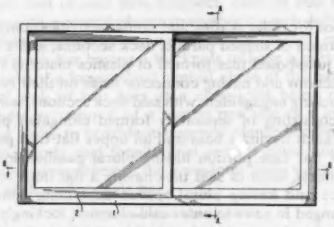
Wolfgang Budich, Troisdorf-Sieglar, Germany, assignor to Dynamit Nobel AG, Troisdorf, Germany

Filed Feb. 25, 1974, Ser. No. 445,657

Claims priority, application Germany, Feb. 24, 1973, 2309273

Int. Cl.² E05D *15/12*

U.S. Cl. 49—442 **26 Claims**



1. An arrangement of profile members for sash windows, sliding doors and the like; said arrangement comprising:

blind frame profile members interconnected to one another to form a blind frame,

sash frame profile members interconnected to one another to form a sash frame,

and connecting means for connecting said sash frame to said blind frame, said connecting means including a resilient mounting profile member for connecting one side of said blind frame with a corresponding side of said sash frame,

wherein said mounting profile member has a cross-section exhibiting a central portion and side portions at opposite sides of said central portion, wherein said side portions are configured for interlocking engagement with locking portions of said blind frame profile member to lock said mounting profile member to said blind frame profile member, wherein said central portion of said mounting profile member is elastically compressible to permit movement of said side portions with respect to one another for accommodating a detachable snap-fit connection of said side portions with said locking portions, wherein said mounting profile member includes guide portions which guidingly support said one side of said sash frame, and wherein said central portion is V-shaped and said side portions are substantially horizontal extensions of the free ends of the legs of the V, wherein said guide portions are formed adjacent the junction of the legs of the V, and wherein said locking portions of said blind frame profile member are undercut groove means.

3,946,525

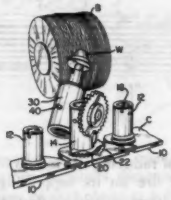
AUTOMATIC BUFFING MACHINE

John Ford Harper, Ames Hollow Road, Portland, Conn. 06480

Filed Nov. 18, 1974, Ser. No. 524,741

Int. Cl.² B24B *5/06*

U.S. Cl. 51—76 R **5 Claims**



1. In combination, a rotated buff wheel, a conveyor having a straight line of travel disposed at a selected angle and distance relative to the axis of rotation of the buff wheel, and a workpiece carried by an adapter that is rotatably mounted on the conveyor, said adapter including means that are rotated by said buff wheel to impart rotation to said workpiece while said workpiece is simultaneously being buff by surface engagement with said rotated buff wheel wherein the workpiece and adapter is both rotated and buffed by surface engagement of the rotated buff wheel.

3,946,526

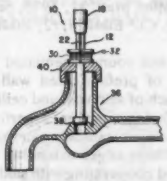
TOOL FOR REFACING VALVE SEATS ON FAUCETS OR THE LIKE

John W. Reutter, 29 W. 41st St., Wilmington, Del. 19802

Filed Feb. 18, 1975, Ser. No. 550,701

Int. Cl.² B24B *15/02*

U.S. Cl. 51—241 VS **5 Claims**



1. A tool for refacing the valve seat of a faucet or the like, including:

a. a shaft,

b. an abrasive member secured to one end of said shaft and adapted for engagement with the valve seat,

c. the free end of said shaft being provided with a transverse, elongated longitudinal slot extending from the

terminal thereof to a point intermediate the length of the shaft,

d. a spool including a bore through which said shaft passes,

e. a pin extending diametrically through the bore of said spool,

f. said pin being disposed in the longitudinal slot of said shaft, whereby said shaft and spool are rotatable together, and

g. a flexible cord wrapped around said spool to effect rotation of the spool and shaft and a corresponding rotation of said abrasive member against the valve seat upon pulling said flexible cord from the spool.

3,946,527

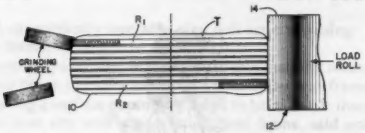
LATERAL FORCE VARIATION CORRECTION OF PNEUMATIC TIRES

Klaus Beer, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 26, 1974, Ser. No. 500,221

Int. Cl.² B24B *1/00*

U.S. Cl. 51—281 R **6 Claims**



1. A method of reducing the lateral force variation exerted by a pneumatic tire on its supporting surface comprising; determining the direction and position on the tire with respect to the circumference of the tire of the maximum lateral force exerted by the tire on its supporting surface during rotation of the tire; removing a larger amount of rubber from the radially outer surface of the axially outer rib of the tire on the side of the tire in the direction of the maximum lateral force at the area of maximum force than from any other area of said axially outer rib, determining the position on the tire of the maximum variation of lateral force from the maximum lateral force, and removing a larger amount of rubber from the radially outer surface of the other axially outer rib at the area of maximum variation from the maximum lateral force than from any other area of said other axially outer rib.

3,946,528

INSULATED BUILDING PANELS AND STRUCTURE CONSTRUCTED THEREWITH

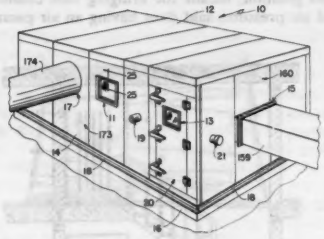
Isadore A. Jacobson, and Michael D. Sepate, both of Cincinnati, Ohio, assignors to B. & J. Jacobs Co., Inc., Cincinnati, Ohio

Continuation of Ser. No. 403,812, Oct. 5, 1973, abandoned. This application Mar. 31, 1975, Ser. No. 563,799

Int. Cl.² E04H *1/12*; E04B *1/88*

U.S. Cl. 52—79 **28 Claims**

1. An airtight and sound attenuated enclosure assembled from a plurality of prefabricated wall, ceilinng, floor and septum panels, each of said wall and ceiling panels comprising a solid exterior facing member, a perforated interior facing member formed in a substantially pan shape having bent edges therearound said bent edges extending to and engaging said exterior facing and cooperating with said exterior facing member to define a sound attenuating space therebetween, insulating material carried in said space to provide the sound attenuation, said solid facing member being a continuous sheet and including a solid return face overlapping the edges of said perforated facing member to define an individual panel, each panel providing a portion of the solid return facing extending beyond the facing surface of said perforate member and generally into the interior of said enclosure, the solid return face of one panel cooperating with a like solid return face of an adjoining panel so as to provide a multiplicity of facing members side by side and to define a seam therebetween, and means connecting said projecting faces together along said



seam, said connecting means extending continuously along said seam to provide an airtight seam between the adjoining panels wherein individual panels can be removed by removing said connecting means therefrom.

3,946,529

FLOOR FOR SPORTS AND IN PARTICULAR FOR ROLLER SKATING

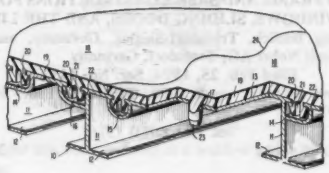
Jean Chevaux, Renens, Switzerland, assignor to Roll-Rink S.A. Switzerland

Filed May 31, 1974, Ser. No. 475,167

Claims priority, application Switzerland, Dec. 7, 1973, 17165/73

Int. Cl.² E04F *15/00*, *13/08*

U.S. Cl. 52—390 **14 Claims**



1. A floor for roller skating and similar activities comprising a deck formed of shaped parallel deck sections, and a multiplicity of juxtaposed tiles formed of plastics material resting on said sections and having connector studs on their bottoms for interlocking engagement with said deck sections, said deck sections consisting of separately formed elongated parallel members each having a base and an upper flat face portion, the upper flat face portion having plural parallel upwardly open channels, each of said tiles having a flat floor forming upper face and having plural spaced depending connector studs arranged in rows to enter said channels lockingly, each tile adapted to be assembled with at least a pair of said deck sections with at least one row of said connector studs lockingly engaged with a channel of one deck section and the other rows of studs engaged with channels of an adjacent deck section.

3,946,530

LAMINAR STRUCTURAL PANEL

Richard K. O'Grady, 2725 Pine Hill Drive, Troy, Mich. 48084

Filed Dec. 23, 1974, Ser. No. 536,927

Int. Cl.² E04F *13/08*; E04C *2/42*

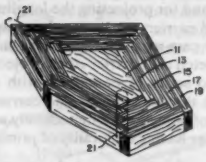
U.S. Cl. 52—390 **10 Claims**

1. A structural panel comprising:

a core having at least three sides; and

a series of wraps consecutively laminated about said core, each of said wraps being formed from members having their ends serially joined, one end face of each of said

members abutting the side face of the end of the consecutive member of the same wrap, the corresponding serial



junctions of said consecutive wraps being aligned in a sawtooth array.

3,946,531

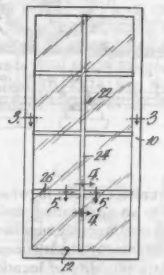
MUNTIN BAR UNITARY FRAME

Henry P. Armstrong, Islington, Canada, assignor to Elca Designs Limited, Toronto, Canada

Filed Jan. 27, 1975, Ser. No. 544,108

Int. Cl.² E06B *3/70*

U.S. Cl. 52—456 **5 Claims**



1. A muntin bar ur 'tary frame comprising a plurality of bars arranged in a desired pattern with at least one cross-joint wherein two of said bars intersect, each of said bars being hollow with a central planar strengthening web defining a pair of tubular cavities extending lengthwise thereof, said central web of each bar having a thickness to have a part thereof at each side of a longitudinal central plane of the bar, and said central web of two bars at a cross-joint being reduced in thickness by removal of a part at one side of a longitudinal central plane to provide juxtaposed planar bonding surfaces meeting along said longitudinal central plane and with the thickness of the frame at the cross-joint being substantially the same as that of a single bar.

3,946,532

TRUSS STRUCTURE WITH FASTENER PLATE JOINT ASSEMBLY

Tyrell T. Gilb, Berkeley, Calif., assignor to Simpson Manufacturing Company, Inc., San Leandro, Calif.

Filed Sept. 20, 1974, Ser. No. 507,943

Int. Cl.² E04C *3/02*

U.S. Cl. 52—692 **15 Claims**

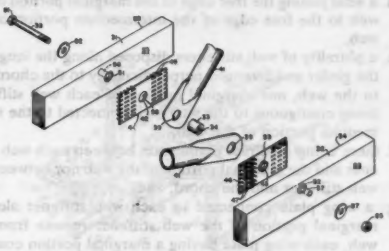
1. A truss joint assembly for transferring tension and compression loads between wood members and metal members in a truss structure having upper and lower chords wherein one of said chords consists of two juxtaposed parallel lumber members, and metal web members having flattened end areas interposed between said lumber members comprising:

a. a pair of continuous sheet metal fastener plates, each including an opening therethrough, and a fastener area on both sides of said opening and disposed from said opening leaving an area around said opening free of fasteners;

b. a plurality of sharp pointed fastener means sufficient in number to transfer substantially all of the web load to said lumber member having a length less than the width of said lumber member connecting said fastener area of said plates to said chord by penetrating the inside faces of said lumber members at a plurality of closely spaced intervals in order to reduce the possibility of failure of said lumber by splitting;

c. the flattened ends of said metal web members are formed with openings therethrough;

d. each of said openings in said plates is surrounded by integrally formed drawn sidewalls extending into said lumber members forming a coaxial annular flange providing bearing area;



e. there being enlarged counter sunk openings in the inside faces of said lumber members dimensioned to receive said annular flanges of said plates in a force fit;

f. a metal load transfer member having a diameter and a length dimensioned to transfer loads between said metal fastener plates and said metal web members by bearing against a substantial portion of said metal plate flanges in a force fit, and against the edges of said openings in said metal web members;

g. means providing lateral support for holding the members of said assembly together; and

h. said web members, plates, fastener means and load transfer member are positioned so that substantially all load transference from said web members to said wood chord members occurs immediately adjacent the centerline of said truss through said plurality of sharp pointed fasteners.

3,946,533

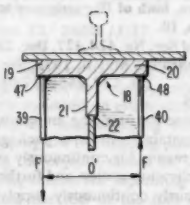
TORSION RESISTANT GIRDER

Donald D. Raugh, Grosse Ile, and Larry C. Jones, Allen Park, both of Mich., assignors to National Steel Corporation, Pittsburgh, Pa.

Filed Oct. 2, 1973, Ser. No. 402,775

Int. Cl.² E04C *3/30*; B23P *17/00*

U.S. Cl. 52—729 **4 Claims**



1. In combination a crane rail and a built-up, welded metallic girder, the combination comprising

a. a chord supporting the crane rail on the top side of the chord, the chord having longitudinal marginal portions,
b. a web arranged below the chord having a longitudinal marginal portion disposed along a line intermediate the longitudinal margins of the chord, the web having an intermediate portion of uniform thickness contiguous to the marginal portion thereof,
c. the marginal portion of the web being appreciably thicker than the contiguous intermediate portion of the web, the chord and the marginal portion of the web being integrally formed with fillets by rolling or extruding, the marginal portion of the web depending a substantial distance below the fillets and having a straight free edge contiguous to the intermediate portion of the web, and the intermediate portion of the web having a straight free edge contiguous to the free edge of the marginal portion of the web,
d. a weld joining the free edge of the marginal portion of the web to the free edge of the intermediate portion of the web,
e. a plurality of web stiffeners disposed along the length of the girder and arranged perpendicularly to the chord and to the web, one marginal portion of each web stiffener being contiguous to the web and connected to the intermediate portion of the web,
f. there being no direct connection between each web stiffener and the marginal portion of the web nor between the web stiffener and the chord, and
g. a wing plate connected to each web stiffener along a marginal portion of the web stiffener remote from the web, each wing plate having a marginal portion contiguous to and connected to the marginal portion of the chord, there being no other connection between the wing plate and the chord.

3,946,534

PROCESS OF BLANKETING WITH INERT GAS

Richard S. Egly, West Terre Haute, Ind., assignor to Commercial Solvents Corporation, Terre Haute, Ind.

Filed Jan. 16, 1975, Ser. No. 541,548
Int. Cl.² B65B *31/06, 31/00*
U.S. Cl. 53—22 R **9 Claims**

1. A process for substantially eliminating oxygen from a shipping container while filling with a liquid comprising the steps of
a. purging said shipping container with an inert gas by introducing said inert gas at the bottom of said container, pressurizing with said gas to about at least 10 psig, releasing said pressure,
b. repeating said pressurizing and releasing steps for a plurality of times,
c. introducing said liquid while maintaining flow of inert gas until said container is filled, and
d. closing said container securely.

3,946,535

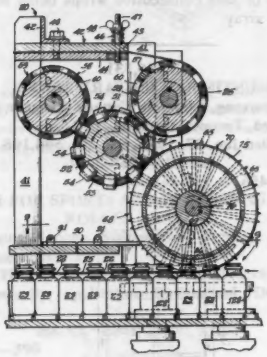
CARRIER APPLICATING MACHINE AND METHOD

Francis H. Bourgeois, Oak Park, and Edward J. McArdle, Morton Grove, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Continuation of Ser. No. 424,427, Dec. 28, 1973, abandoned.
This application May 6, 1975, Ser. No. 575,114
Int. Cl.² B65B *27/04*
U.S. Cl. 53—35 **12 Claims**

1. In a machine for applying an apertured carrier stock to pluralities of containers to form packages in which the machine includes means for continuously supplying said carrier stock to an application station and further includes means for contemporaneously continuously supplying a series of containers to said application station wherein the improvement comprises, a rotating pinwheel mounted in said application station and comprising a plurality of pins having pointed tips, said pins mounted in said pinwheel in spaced apart pairs for rotation therewith for receiving the longitudinal side marginal edge of said carrier stock at positions spaced from the container receiving apertures of said carrier stock projected onto the tips of said pins, rotating means receiving said carrier stock thereabout and for projecting the longitudinal side marginal edges of said carrier stock onto the pointed tips of said pins, and spreader cam means for spreading said spaced apart pairs of pins to stretch said carrier stock projected thereon for application to said series of containers with said containers extending through the apertures of said carrier stock.

8. In a method of applying a longitudinally and transversely dimensioned carrier having a plurality of primary apertures to



containers to form a carrier pack, in which the carrier is continuously supplied to an application station and in which a series of containers is continuously supplied to said application station, wherein the improvement comprises the steps of engaging the carrier at a plurality of locations spaced apart from the primary apertures by penetrating the longitudinal side marginal edges of said carrier at said application station with a plurality of pins mounted for rotation on a pinwheel about an axis, spreading the pins while the pinwheel is rotated to temporarily strain the carrier, synchronously applying the engaged carrier to said series of containers moving past the pinwheel in said application station, and withdrawing the pins from the applied carrier.

3,946,536

MACHINE FOR PLACING INJECTABLE AMPOULES, VIALS AND SIMILAR LIQUID CONTAINERS IN THEIR RESPECTIVE HOLDERS

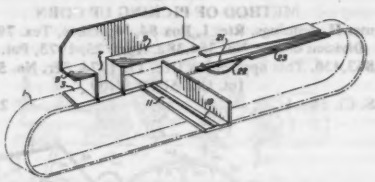
Don Luis Antonio Marquez Serra, 126 Calle Bailen, Barcelona, Spain

Filed Jan. 22, 1975, Ser. No. 543,137
Claims priority, application Spain, Jan. 23, 1974, 422692
Int. Cl.² B65B *35/44, 43/00*
U.S. Cl. 53—148 **4 Claims**

1. A machine for inserting ampoules and similar articles in holders erected from a flat foldable blank, said machine comprising:
a. a conveyor chain adapted to be driven at uniform forward speed by means of an appropriate drive system;
b. ramp means for containing a stack of blanks located adjacent said chain, said ramp means adapted to supply blanks synchronized with the movement of said chain;
c. a series of trays attached to said chain, each of said trays defining a predetermined number of receptacles transversely arranged relative to said chain, said receptacles being regularly spaced and corresponding in number to the number of ampoules that each of said holders is to

receive, each of said trays being provided with projection means adapted to engage and remove a single blank form said stack as said tray passes by said ramp means;

d. a supply hopper having an outlet superjacent said chain, said hopper being configured to orient said ampoules in proper alignment whereby said ampoules are discharged by gravity transversely of said chain in said receptacles;



e. means for erecting said blanks into holders; and

f. a camming surface located along the path of the chain adapted to engage the ampoules thereby moving said ampoules in a transverse direction relative to the chain and into engagement with the aligned holders.

3,946,537

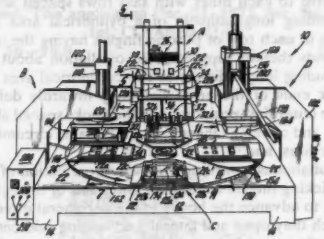
APPARATUS FOR FORMING AND CLOSING A DISPLAY PACKAGE

George R. Hair, Clifton, and Albert Agostinelli, Paterson, both of N.J., assignors to New Jersey Electronic Co., Clifton, N.J.

Filed June 10, 1974, Ser. No. 478,179

Int. Cl.² B65B *47/02, 47/10*

U.S. Cl. 53—184 **13 Claims**



1. An apparatus for forming and closing a display package from a card blank having at least one window opening and which is provided with an overlying plastic sheet for forming pockets in the window openings which is adapted to be positioned to overlie the window openings and a marginal area of the card blank surrounding the opening, comprising a movable carrier for the blank and the overlying plastic sheet, means for moving said carrier through an operation path, heat forming means arranged along said operation path and operable on said plastic sheet to form a pocket in the sheet extending through the window opening of said card, said heat forming means including a movable upper platen arranged over said operational path, upper platen movement means connected to said upper platen to move it toward and away from said movable carrier for engagement and disengagement with a card thereon, a movable lower platen below said operation path, lower platen movement means connected to said lower platen to move it toward and away from said carrier for association and disassociation with a card thereon, heating means associated with said upper and lower platens for heating the plastic overlying the card in the vicinity of the window, forming means associated with said upper and lower platens for forming said plastic into a pocket bulging outwardly from said card, said apparatus further comprising product loading means and card folding means along said operation path engageable with each card in succession on the movable carrier and operable to fold said card as it is moved so that a portion thereof having said window is positioned to underlie a remaining portion thereof which is folded thereover, and sealing means along said operation path for sealing said card and said pocket.

3,946,538

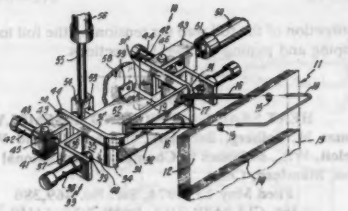
BAG HOLDING DEVICE

Arnold Lipes, 521 Merton Road, Cote St. Luc, Montreal, Quebec, Canada

Continuation of Ser. No. 422,364, Dec. 6, 1973, abandoned. This application June 27, 1975, Ser. No. 591,081

Int. Cl.² B65B *43/36*

U.S. Cl. 53—189 **9 Claims**



1. A bag holding device for holding bags of the type having an extended tab secured to a bag sidewall and extending above a mouth opening, said holding device comprising bag opening means for opening said mouth of a first bag from a plurality of facially aligned bags, actuable holding means for engaging on either side thereof a portion of said extended tab of said first bag above said mouth opening, said actuable holding means having clamping means including two pairs of clamping surfaces, means for actuating said clamping surfaces to rigidly engage therebetween a portion of said tab adjacent opposed side edges of said tab prior to displacement of said first bag from said plurality of facially aligned bags, and means for displacing said first bag from said plurality of bags while maintaining a clamped relationship between said clamping surfaces and said tab.

3,946,539

APPARATUS FOR WRAPPING OBJECTS

Fritz Noack, Ottobeuren, Germany, assignor to Firma Emil Pester, Platinen-u. Apparatefabrik, Wolfertschwenden, Germany

Filed Sept. 5, 1974, Ser. No. 503,357

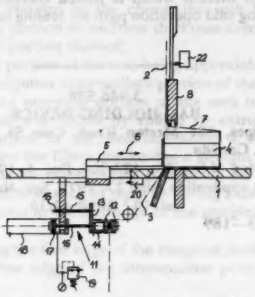
Claims priority, application Germany, Oct. 5, 1973, 2350130; Oct. 10, 1973, 2350828

Int. Cl.² B65B *13/22*

U.S. Cl. 53—198 R **11 Claims**

1. Apparatus for covering or wrapping objects with a foil wrapping, comprising at least one supply roller for the foil, two clamping elements mounted on either side of the path of movement of the objects, said clamping elements in the clamping position gripping two overlapping portions of the foil loop or band encasing the objects, means for joining the two foil portions, separating means for separating the foil wrapping thus formed from the rest of the foil, tension means drawing the foil loop taut around the objects and mounted on one side of the path of the objects at a distance from said clamping elements, said tension means comprising gripper jaws between which the foil web is passed in a single layer, said

tension means having drive means and being mounted for movement into an opposite direction with respect to the supply direction of the foil web for tensioning the foil loop before clamping and joining the two foil sections.



3,946,540

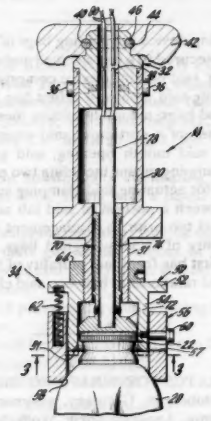
HEAT SEAL CAPPER HEAD ASSEMBLY

Thomas M. Solberg, Belvidere, Ill., and Donald W. Hamil, Beloit, Wis., assignors to Champion International Corporation, Stamford, Conn.

Filed May 13, 1974, Ser. No. 469,380

Int. Cl.² B67B 3/12; B65B 7/28, 51/10

U.S. Cl. 53—341 **6 Claims**



1. A heat seal cap head assembly for securing a heat seal capper to a container to form a heat seal closure having a central portion and a skirt comprising:

an elongated tubular housing;

adapter means secured to one end of the housing for mounting the assembly on a conventional filling apparatus for the container;

and a folding and heat sealing means secured to the opposite end of the housing, said folding and heat sealing means including,

an annular collar extending beyond the end of the housing and operative for folding each cap about the opening of the container to form the skirt portion thereof; and

heating means disposed internally of the annular collar for applying heat to the cap to form a fluid tight closure for the container, which annular collar includes the combination of an annular folder ring fixedly secured to the end of the housing, and an annular center collar concentric with and slidably mounted on said folder ring, with spring means disposed between said annular folder ring and the center collar for braising the center collar toward its extended position.

3,946,541

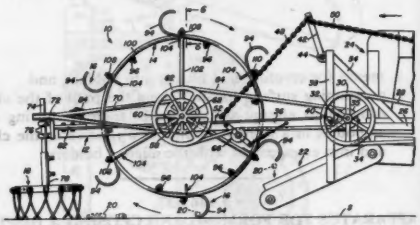
METHOD OF PICKING UP CORN

James H. Jennings, Rte. 1, Box 84, Muleshoe, Tex. 79347

Division of Ser. No. 354,382, April 25, 1973, Pat. No. 3,863,430. This application Dec. 17, 1974, Ser. No. 535,956

Int. Cl.² A01D 51/00

U.S. Cl. 56—1 **2 Claims**



1. A method of picking ears of corn from the ground, comprising the steps of:

a. supporting a plurality of elongated rows of picking fingers, including elongated arms and back-turned, semi-circular hooks at one set of ends of the arms in position relative to each other with said rows spaced about and extending longitudinally of a cylindrical area and the arms in each row of picking fingers having the other set of ends thereof supported for oscillation about an axis extending longitudinally of the cyclindrical area and the hook ends of the arms yieldingly inwardly deflectable from outermost positions with the hooks spaced about the area and opening tangentially in the same circumferential directions; and,

b. simultaneously orbiting the axes of oscillation of the sets of picking fingers about the center axis of the cylindrical area to advance the hooks in the peripheral directions in which they open and laterally advancing said center axis over the ground at an elevation with the rows of picking fingers having the hooks thereof successively engaging the ground when disposed at the lowermost peripheral portion of said area and with the center axis being advanced in the direction in which the lowermost hooks open.

3,946,542

TOBACCO HARVESTING AND TREATING SYSTEM

William R. Long, Tarboro, N.C., assignor to Long Mfg. N. C., Inc., Tarboro, N.C.

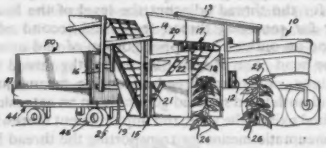
Filed Jan. 31, 1975, Ser. No. 546,168

Int. Cl.² A01D 45/16

U.S. Cl. 56—1 **3 Claims**

1. In the harvesting and treating of tobacco using an automatic defoliator for stripping all of the tobacco leaves from a stalk and forming a mass of leaves adjacent to the bottom of the stalk, raising said mass of leaves from the stalk while maintaining substantially zero ground speed between the mass of leaves and the stalk, and conveying the mass of leaves upwardly and rearwardly from the stalk, the method comprising the steps of: discharging the mass of leaves into a relatively large container having a first side wall means positioned in a generally horizontal plane when the container is being filled and with the upper opposite side being open, distributing the tobacco leaves throughout the container so that the leaves are

substantially flat and generally parallel with said first side wall means of the container, positioning second side wall means along the open side of the container and opening the top and bottom thereof when the container has been filled with tobacco leaves thereby providing a flow path in one direction through the container, inserting a plurality of pin means through at least one of said first and second side wall means, rotating the container substantially 90° so that the tobacco



leaves are disposed in vertical planes, positioning the container within the interior of a tobacco barn having closure means and a selectively operable heater, closing the barn after the barn has been filled with containers, energizing said heater to provide heated air, causing the heated air to flow through the flow path in said containers to cure the tobacco leaves therein, removing the containers from the barn after said leaves have been cured, and discharging the cured tobacco leaves from said container.

3,946,543

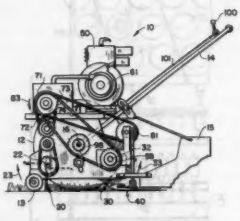
POWER MOWER WITH HYDRAULIC DRIVE

William E. Templeton, 1807 W. Hanley Road, Lexington, Ohio 44904

Continuation-in-part of Ser. No. 206,842, Dec. 10, 1971, abandoned. This application Dec. 21, 1972, Ser. No. 317,103

Int. Cl.² A01D *43/02*

U.S. Cl. 56—10.9 **18 Claims**



1. In a mower of the type having a frame structure supported on ground engaging wheels for movement along a forward path of motion over a ground surface, and a cutter carried by the frame structure for movement relative thereto to shear grasses as the mower is moved along the path, the wheels being rotatable about axes which extend generally parallel to the ground surface over which the mower is operated, the wheels being rotatable in a given direction of rotation when the mower moves forwardly along said path, the improvement comprising:

a. rake means including a first rotatable rake structure carried by the frame structure at a position forwardly of the cutter and being rotatable in a direction opposite such given direction about an axis generally parallel to the ground surface over which the mower is operated for combing grasses encountered ahead of the cutter, for leaning such grasses in a direction facing away from the cutter to lift, straighten and align the grasses, and for removing foreign objects from these grasses during combing;

b. said rake structure having a plurality of teeth operable to engage grasses encountered along the path ahead of the cutter; and

c. drive means coupled in driving relationship to said rake structure for rotating said rake strcture in a direction opposite such given direction to comb grasses encountered ahead of the cutter and lean these grasses forwardly in a direction facing away from the cutter to lift, straighten and align the grasses, such combing action being operative to remove foreign objects from these grasses during combing.

3,946,544

ROTARY RAKE MEMBERS

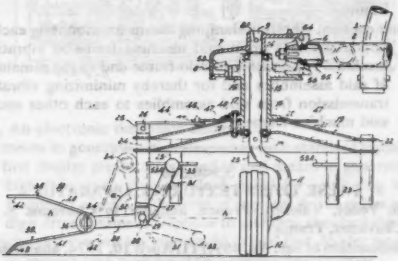
Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Filed July 2, 1974, Ser. No. 485,257

Claims priority, application Netherlands, July 5, 1973, 7309381

Int. Cl.² A01D *79/00*

U.S. Cl. 56—370 **43 Claims**



1. A rotary rake member having substantially vertical shaft means, outer supporting means a plurality of tines and supports that are pivotally connected to said supporting means to turn about respective axes, said rake member being rotatable about said shaft means and said tines being freely pivotable on portions of their supports, counterweights being secured to inner portions of said supports, said rake member being rotatable at an operational speed and said tines being initially pivotable on their supports from inner non-working positions to outer positions by centrifugal force to shift the centers of gravity of said supports, said tines, in their outer positions, together with their corresponding supports being turnable about their pivot connections on said supporting means by said weights to operative raking positions during rotation.

3,946,545

SPINDLE MOUNTING MEANS FOR TEXTILE TWISTING MACHINE

Lester W. Pray, Clemson, S.C., assignor to Platt Saco Lowell Corporation, Greenville, S.C.

Filed Apr. 22, 1975, Ser. No. 570,547

Int. Cl.² D01H *7/10, 1/14*

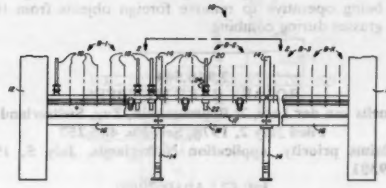
U.S. Cl. 57—1 R **20 Claims**

1. In a textile twisting machine having an elongate frame, and a plurality of spindle units adapted to be mounted in first and second rows adjacent first and second opposite sides of said elongate frame, the improvement comprising:

spindle mounting means for mounting said spindle units adjacent each side of said machine frame in vibration-insulated relationship to said machine frame and to said spindle units adjacent the other side of said machine frame, said spindle mounting means including

first and second spindle mounting assemblies for respectively mounting said spindle units adjacent said first and second sides of said machine frame, each of said assemblies including an elongate member supporting a plurality

of said spindle units adjacent the corresponding one of said sides of said machine frame and extending longitudinally of and generally parallel to said one of said sides of said machine frame, and at least one transverse stabilizing member connected adjacent its outer end to said elongate member and extending transversely therefrom inwardly toward, but terminating in spaced relationship to, another of said assemblies mounting a plurality of said spindle



units adjacent the other of said sides of said machine frame;

and resilient vibration-damping means for mounting each of said assemblies upon said machine frame in vibration-insulated relationship to said frame and to the remainder of said assemblies and for thereby minimizing vibration transmission from said assemblies to each other and to said machine frame.

3,946,546

FALSE TWIST TEXTURING APPARATUS

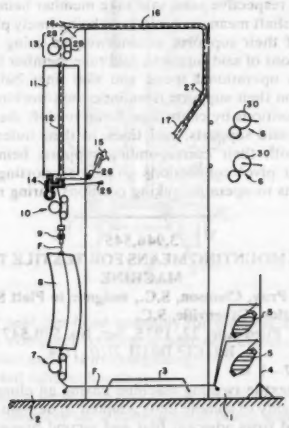
Jean Venot, Villerest, France, assignor to Chavanoz S. A., Chavanoz, France

Continuation of Ser. No. 459,711, April 10, 1974, abandoned. This application Feb. 3, 1975, Ser. No. 546,359

Claims priority, application France, Apr. 19, 1973, 73.15059

Int. Cl.² D01H *13/04*, *13/28*

U.S. Cl. 57—34 HS **4 Claims**



1. In a machine for the false twist texturing of textile threads in a plurality of side-by-side thread treating positions including two upstanding, spaced support frames positioned in facing relation, an operator walkway at the bottom of and extending between the frames to permit access to the thread treating positions, one of the frames supporting thread supply means in a lower portion thereof and thread take-up means in an upper portion thereof and the other frame supporting thread heaters and false twist spindles for treating the threads, and each of the thread treating positions having a thread path extending between the thread supply and take-up means being defined by a first thread advancing means positioned in a lower portion of the other frame for receiving thread from said thread supply means, a first thread heater positioned above said first thread advancing means and supported on said other support frame, a false twist spindle positioned above said first heater, second thread advancing means positioned above said spindle, a second thread heater positioned above said second thread advancing means and having a substantially straight heating tube for passage of the thread, the heating tube having an inlet for the thread adjacent the level of the head of an operator for receiving thread from said second advancing means and an outlet in an upper portion of said other frame above the head of an operator for exit of the thread from the heating tube, and third thread advancing means positioned above said outlet and situated generally on an extension of the longitudinal axis of the tube; the improvement therewith comprising pneumatic means for transporting the thread from the second thread advancing means, through the tube of the second heating means, through the third thread advancing means and to the vicinity of the thread take-up means, said pneumatic means including a pneumatic transportation tube extending across the walkway and having a thread-receiving mouthpiece situated above and in proximity to said third thread advancing means for receiving a thread therefrom and a thread outlet positioned adjacent said thread take-up means.

3,946,547

DEVICE FOR MANIPULATING TEXTILE COPS

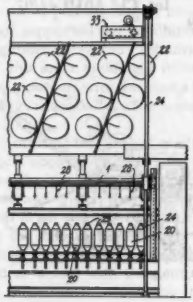
Angelo Salmoiraghi, Via Pergolesi 11, Milan, Italy (20124)

Filed Feb. 25, 1974, Ser. No. 445,347

Claims priority, application Italy, Mar. 14, 1973, 21590/73

Int. Cl.² D01H *9/04*

U.S. Cl. 57—52 **4 Claims**



1. A device for manipulating textile cops, comprising:

a plurality of drawing-twisting frames;

a horizontal, vertical movable rail at each side of each of said frame, each of said rails having an entrance/exit end and a closed end, said rails being vertically movable from a lowered position to a raised position;

a plurality of hook-like members spaced at predetermined intervals along said rails by interconnecting chain sections, said chain sections adapted to be longitudinally guided by said rails, said hook-like members being selectively engageable with a corresponding like number of cops;

means for moving said rails vertically between said lowered and raised positions;

a carriage means carrying a plurality of carriage rail sections extending normal to said vertically movable rails and having curved end portions for selective alignment with the entrance/exit ends of said vertically movable rails when said rails are in their raised positions;

a chain section discharge station where a chain section of full cops is to be delivered;

a chain section charging station where a chain section of empty cops is to be received; and

means for moving said carriage means between a first position adjacent said discharge station, a second position adjacent said charging station, first intermediate positions adjacent the entrance/exit ends of selected ones of said rails for delivering chains section of empty cops thereto, and second intermediate positions adjacent the entrance/exit ends of selected other of said rails for receiving chains full cops therefrom, whereby full cops are received from said frames and delivered by said carriage means to said discharge station and empty cops are delivered by said frames from said charging station to said frames.

3,946,548

BULKY MULTIFILAMENT YARN AND PROCESS FOR MANUFACTURING THE SAME

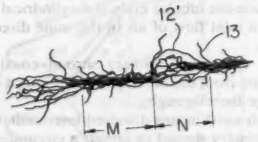
Hajime Hino; Yoshiyuki Sasaki, both of Takatsuki, and Yukimasa Fujisawa, Ibaraki, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed July 5, 1974, Ser. No. 485,834

Claims priority, application Japan, July 12, 1973, 48-77859; Mar. 2, 1973, 48-24360

Int. Cl.² D02G *1/02, 3/22, 3/34*

U.S. Cl. 57—140 J **9 Claims**



1. A process for manufacturing a bulky, crimped thermoplastic polymer multifilament yarn, which comprises feeding a continuous multifilament yarn having a twist less than approximately 800 turns per meter to a high velocity fluid jet where a multitude of loops and arches are formed on the yarn surface and individual filaments are irregularly entangled with each other, and the subjecting the multifilament yarn to a combination of the steps of false twisting such that the whole multifilament yarn is false twisted, and of passing the multifilament yarn over a friction member thereby cutting at least some of the looped and arched filaments on the yarn surface to form filament ends.

3,946,549

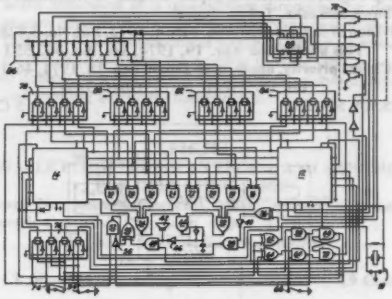
ELECTRONIC ALARM WATCH

Arthur F. Cake, Smithtown, N.Y., assignor to Uranus Electronics, Inc., New Rochelle, N.Y.

Filed Dec. 26, 1973, Ser. No. 427,834

Int. Cl.² G04C *21/00*

U.S. Cl. 58—38 R **8 Claims**



1. An electronic timepiece comprising:

a means to generate a high frequency time-standard signal;

a first divider means connected to said means to generate a high frequency time standard signal for producing low frequency signals in the form of segment driver pulses and digit driver pulses in response to said time standard signal;

segment driver means connected to said first divider means to receive said segment driver pulses therefrom;

digit driver means connected to said first divider means to receive digit driver pulses therefrom;

digital display means connected to said segment driver means and said digit driver means for the digital display of time;

a second divider means connected by a first logic gate means controlled by a digit pulse connection from said second divider means and a digit pulse connection from said first divider means for delivery of an output to an inverter connected to a second logic gate means input having another input connection from said means to generate a high frequency time signal such that said second divider means may be synchronized with said first divider means, said second divider means being also productive of segment driver pulses for connections to said segment driver means;

a diode bridge circuit connection between portions of said second divider means to clamp a predetermined order of segment driver pulses to be eminating from said second divider means coordinated with a predetermined digit driver pulse;

pure logic comparator means connected between said first divider means and said second divider means, said pure logic comparator means comprising a plurality of exclusive OR gates having a first input connection of each connected to the connections of said first divider means to said segment driver means and second input connections to the connections of said second divider means to said segment driver means, said exclusive OR gates being paired to provide a plurality of first output connections and a plurality of second output connections;

logic switch means including a first NOR gate and a second NOR gate whose inputs are connected, respectively, to said first output connections and said second output connections of said pure logic comparator means to control a NAND gate having its inputs connected to the outputs of said first NOR gate and said second NOR gate such that there is produced a signal when said first divider means and said second divider means are producing

comparable pulses in said connections to said segment driver means and said exclusive-OR gates; and

indicator means connected to the output of said NAND gate of said logic switch means to be actuated by signals therefrom.

3,946,550

QUARTZ CRYSTAL TIMEPIECE

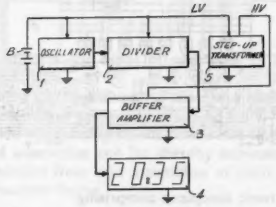
Kinji Fujita, Shimosuwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Division of Ser. No. 223,666, Feb. 4, 1972, Pat. No. 3,828,547. This application Apr. 19, 1974, Ser. No. 462,553

Claims priority, application Japan, Feb. 18, 1971, 46-7161

Int. Cl.² G04B *19/30*; G04C *3/00*

U.S. Cl. 58—5 R **5 Claims**



1. A timepiece comprising timekeeping circuit means for producing low frequency timing signals in response to a high frequency time standard signal; liquid crystal display means for the digital display of time; driving circuit means intermediate said time keeping circuit means and said liquid crystal display means for producing driving signals in response to said timing signals for driving said liquid crystal display means; battery voltage source means for producing a low voltage for powering said timekeeping circuit means; and D.C. step-up transformer means for producing a high voltage from a low voltage for application to said driving circuit means as a power signal, said D.C. step-up transformer means having an input supplied with an oscillatory low voltage signal by said timekeeping circuit means, whereby said driving signals are of a high voltage.

3,946,551

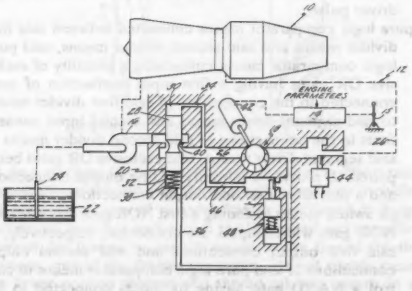
PUMPING AND METERING SYSTEM

Kail L. Linebrink, Bloomfield, and Lawrence S. Smith, Simsbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jan. 17, 1974, Ser. No. 434,150

Int. Cl.² F02C *9/08*

U.S. Cl. 60—39.28 R **7 Claims**



1. A fuel metering system cooperating with an electronic fuel control adapted to monitor and select the fuel flow of a turbine type of power plant, the combination including a source of fuel, fuel connecting means interconnecting said source and said power plant, a power plant driven centrifugal pump in said fuel connecting means, an electrically driven displacement type of pump responding to said electronic control disposed in said fuel connecting means in series flow relationship to said centrifugal pump, said displacement type of pump pressurizing the fuel delivered by said centrifugal pump when the power plant is operating below a predetermined power plant operating parameter and continuously metering said fuel, and said centrifugal pump solely pressurizing said fuel when the power plant is operating above said predetermined power plant operating parameter.

3,946,552

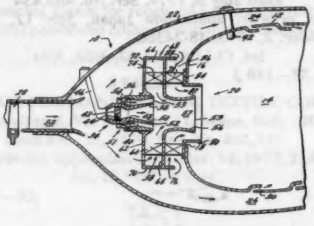
FUEL INJECTION APPARATUS

Barry Weinstein, Georgetown, and Edward Donald Riley, Groveland, both of Mass., assignors to General Electric Company, Lynn, Mass.

Filed Sept. 10, 1973, Ser. No. 395,605

Int. Cl.² F02C *7/22*; B05B *7/10*

U.S. Cl. 60—39.74 R **8 Claims**



1. A fuel injection apparatus comprising:

a fuel injector having a cylindrical housing, a tubular body centrally disposed within the cylindrical housing and spaced apart therefrom so as to define a first annular air passage therebetween, fuel swirl means disposed within the tubular body for imparting a swirl to an inlet stream of fuel wherein the interior surface of the tubular body converges to a minimum diameter orifice downstream from the swirl member, and thereafter diverges outwardly terminating in a transverse edge so as to generally define a venturi, and a primary air swirl means having a plurality of circumferentially spaced apart swirl vanes disposed intermediate the tubular body and cylindrical housing for swirling an inlet flow of air in the same direction as the fuel swirl;

a generally cylindrical primary shroud coaxially spaced downstream from the fuel injector defining a central core air passage therethrough;

secondary air swirl means disposed intermediate the injector and primary shroud to impart a circumferential swirl component to the flow through the core wherein the secondary swirl component is in the same circumferential direction as the fuel and primary air swirl;

tertiary air swirl means disposed downstream of the secondary air swirl means to impart a circumferential swirl component in the direction opposing that of the secondary swirl means such that fuel reaching the downstream end of the primary shroud is atomized by the shear stresses developed by the counter-rotating aerodynamic forces at the confluence of the secondary and tertiary swirls and

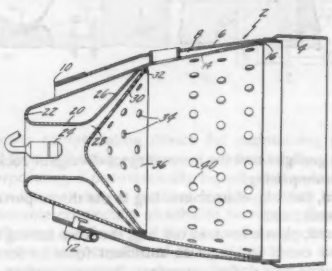
wherein the primary swirl means are disposed at the inlet to the first annular air passage, and the inner and outer surfaces of the first annular air passage coverage conically inward to a minimum cross-sectional area and then diverge conically outward so as to define a second venturi coaxially disposed about the first venturi.

7. A fuel injection apparatus comprising:
fuel injection means;
a generally cylindrical primary shroud coaxially spaced downstream from the fuel injection means defining a central core air passage therethrough;
primary air swirl means disposed intermediate the injector means and primary shroud to impart a circumferential swirl component to the flow through the core wherein the swirl means includes a first plurality of circumferentially spaced swirl vanes disposed intermediate a first radially extending circumferential wall member concentric to the fuel injection means and a second axially spaced apart radially extending circumferential wall member connected to the primary shroud;
secondary air swirl means disposed downstream of the primary air swirl means to impart a circumferential swirl component in the direction opposing that of the primary swirl means such that fuel reaching the downstream end of the primary shroud is atomized by the shear stresses developed by the counter-rotating aerodynamic forces at the confluence of the primary and secondary swirls wherein the secondary swirl means include a second plurality of circumferentially spaced swirl vanes disposed intermediate the second wall member and a third axially spaced apart radially extending circumferential wall member;
and a mini cowling having an outer cylindrical wall in connection to the outer periphery of the second wall member and defining first and second annular plenums which respectively direct inlet airflows to the secondary and tertiary swirl means from an external source of pressurized air wherein the pressurized airflow entering each plenum is rapidly diffused in order to reduce the variation in pressure and velocity of the inlet airflow to the respective swirl vanes.

3,946,553
TWO-STAGE PREMIXED COMBUSTOR

Richard Roberts, Marlborough; Alexander Vranos, Rockville; Barry C. Schlein, Wethersfield, and David H. Rummel, Manchester, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 10, 1975, Ser. No. 557,008
Int. Cl.² F02G 3/00
U.S. Cl. 60—39.74 R **10 Claims**

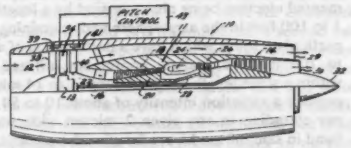


1. A combustor construction having axially separated primary and secondary premix stages, the secondary premix stage including:
an outer diverging sleeve forming the outer wall of the secondary fuel and air mixture passage, an inner diverging sleeve within and spaced from the outer sleeve and defining the inner wall of said passage, said sleeves being arranged to form a passage decreasing in crosswise dimension in the direction of flow therethrough, and being closely spaced at the downstream end of the inner sleeve to form an annular discharge passage, said inner sleeve having rows of openings therethrough and defining within said sleeve a secondary flameholder, and
the primary premix stage including:
a frustoconical outer sleeve within said inner diverging sleeve and secured thereto,
an inner substantially conical member within and spaced from said frustoconical outer sleeve and defining therewith a diverging annular passage for the primary fuel and air mixture, said diverging passage decreasing in transverse dimension in a downstream direction, the downstream edge of the conical member being closely spaced from the outer frustoconical sleeve to define an annular discharge passage for the primary mixture, and
said conical member having a plurality of openings therein and forming a primary flameholder.

3,946,554
VARIABLE PITCH TURBOFAN ENGINE AND A METHOD FOR OPERATING SAME

Gerhard Neumann, Swampscott, Mass., assignor to General Electric Company, Cincinnati, Ohio

Filed Sept. 6, 1974, Ser. No. 503,752
Int. Cl.² F02K 3/06
U.S. Cl. 60—204 **19 Claims**



1. In a method of operating a gas turbine engine having a rotatable fan and in which at least one stage of fan blades is rotating to provide a forward propulsive thrust, the pitch of the rotating stage of fan blades being changed for the purpose of reversing the direction of gas flow therethrough, the step of:
reversing the pitch of at least one stage of essentially radial, nonrotatable, variable guide vanes, which are axially disposed with respect to said rotating fan blades, in a predetermined relationship with the change in pitch of said fan blades to reduce aerodynamically induced stresses in said fan blades as said fan blades change between the forward and the reverse thrust modes.

3,946,555
PROCESS FOR SIMULATING TURBOJET ENGINE PLUMES

Philip J. Goede, Lorton, Va., assignor to Atlantic Research Corporation, Alexandria, Va.

Filed Aug. 22, 1973, Ser. No. 390,996
Int. Cl.² C06D 5/00
U.S. Cl. 60—207 **132 Claims**

1. A process for simulating the plume produced by a turbojet engine comprising producing a plume comprising high-velocity combustion gases admixed with small infrared-radiating solid particles, by
1. burning in a combustion chamber provided with a restricted nozzle, a fuel-rich solid gas-generating composition, comprising
a. solid organic fuel binder,
b. solid oxidizer, and
c. dispersed, inorganic, particulate solids selected from the group consisting of oxidizable material, non-oxidizable material, and mixtures thereof,
said oxidizer being present at least in an amount sufficient to support combustion of said composition, thereby producing hot combustion gases by oxidation of said organic fuel binder

and heating said dispersed particulate solids, up to an amount sufficient additionally to oxidize at least some of said inorganic oxidizable particulate solids when such oxidation is desired, the maximum amount of oxidizer in said composition being stoichiometrically insufficient

a. to oxidize all of the carbon present in the composition to CO when the inorganic particulate solid component is non-oxidizable;

b. to oxidize all of both the carbon and an oxidizable inorganic particulate solid to CO and the stable inorganic oxide of said oxidizable particulate when an inorganic particulate solid component is oxidizable; and

c. to oxidize any substantial amount of hydrogen to H_2O;

2. ejecting the combustion products out of said restricted nozzle directly into the atmosphere or into the plume of a separate gas-generating device which ejects into atmosphere, the plume of which is inadequate in infrared radiation or such radiation and size to simulate the plume of a turbojet engine; said oxidizable material in its oxidized or unoxidized state and said non-oxidizable material, when ejected as components of the combustion products of said gas-generating composition through said restricted nozzle, being particulate solids capable of radiating continuum infrared radiation within the wavelength range of about 1 to 14 microns; the gaseous plume formed by the direct ejection or by the combined augmented ejection being characterized by a length of about 1 to 100 feet in the atmosphere and containing dispersed particulate solids which have a particle size of about 0.01 to 100 microns, radiate continuum infrared radiation within a wave length range of about 1 to 14 microns, and provide a radiation intensity of about 10 to 50,000 watts per steradian in any given 2 micron wide wave length band in said infrared wave lengths; the particular characteristics of said plume being determined by and similar to the infrared radiation and spatially-extended characteristics of the particular turbojet engine being simulated.

3,946,556

INTEGRATED NOZZLE AND STEERING MECHANISM FOR WATERJETS

Fritz C. Catterfeld, Canoga Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 25, 1974, Ser. No. 518,012
Int. Cl.² B63H *11/10*
U.S. Cl. 60—221 **2 Claims**

1. A steerable waterjet apparatus for watercraft wherein fluid is vectored upstream of a primary nozzle without substantial propulsion efficiency losses when said nozzle is manipulated to steer said watercraft through the water, said apparatus comprising:

an outer cylindrical housing member in communication with an upstream inlet opening at one end and, a convex spherically-shaped opposite downstream end having an opening formed therein,

an inner cylindrical body positioned within, spaced from and concentric with said outer housing, said inner body at its upstream end being adjacent to an inducer pump and at its opposite downstream end, said inner body terminates in half a sphere, an outside wall of said inner body and an inside wall of said outer housing forming an annular chamber thereby.

an outer movable member forming a primary nozzle opening therein having an inside spherically-shaped concave surface that is interfitted with said convex spherically-shaped open ended outer housing member, said outer nozzle member is connected to said outer housing member and movable over said convex surface, of said outer housing member,

a nozzle center piece, spaced from and adjacent said primary nozzle opening, the inner concave surface of said center piece slidably mates with the outer convex surface of said half sphere at said upstream end of said inner body, said center piece having a spike portion extended into the center of said primary nozzle formed by said movable nozzle member, said center piece having a multiplicity of support webs affixed to, equidistantly spaced one from the other and radially disposed between an inner surface of said movable nozzle member and an outer surface of said center piece, to maintain said extended spike portion within the center of said primary nozzle as said movable nozzle member is manipulated to steer the watercraft, the center piece serves to prevent turbulent flow which forms adjacent said half sphere of said inner body opposite said primary nozzle opening, and

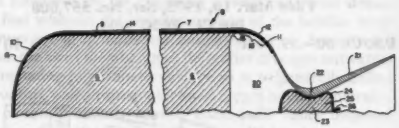
means to manipulate said nozzle member to effect watercraft steering.

3,946,557

ROCKET MOTOR CONSTRUCTION

Albert William Macbeth, Brigham City, Utah, assignor to Thiokol Corporation, Newtown, Pa.

Filed July 19, 1974, Ser. No. 489,961
Int. Cl.² F02K *9/04*
U.S. Cl. 60—253 **2 Claims**



1. A gastight seal for a convergent-divergent rocket thrust nozzle comprising:

a thin, flexible, elastomeric bag in the throat portion of the nozzle; and

a cured, plastic foam in the bag, the foam having been cast and cured in situ with sufficient foam to form a plug having an axially convergent-divergent surface conforming exactly to the surface of the nozzle throat.

3,946,558

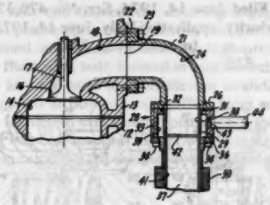
EXHAUST SYSTEM AND METHOD

William H. Beekhuis, Jr., 27686 Natoma Road, Los Altos Hills, Calif. 94022

Filed Aug. 6, 1973, Ser. No. 386,059
Int. Cl.² F02B *75/10*
U.S. Cl. 60—274 **14 Claims**

9. A method as in claim 8 together with the step of collecting the mixture of exhaust gas and atmospheric air and main-

taining said mixture at a relatively high temperature for a substantial period of time to enhance the combustion of unburned hydrocarbons and the conversion of carbon monoxide to carbon dioxide.



3,946,559

HEAVE COMPENSATING DEVICES FOR MARINE USE

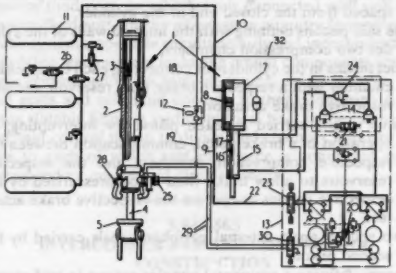
William David Stevenson, Edinburgh, Scotland, assignor to Brown Brothers & Company Limited, Edinburgh, Scotland

Filed Oct. 8, 1974, Ser. No. 513,115

Claims priority, application United Kingdom, Oct. 9, 1973, 47125/73

Int. Cl.² F15B *1/02*

U.S. Cl. 60—413 11 Claims



1. A heave compensating device for maintaining a load suspended from a floating platform at a substantially constant level incorporating a pneumatically biased passive load-supporting system including a resilient load-supporting bidirectionally movable connection attachable between a fixed support on a floating platform and the load to be supported, said passive system being capable of being set to exert continuously on said connection a chosen datum load-supporting force, and an active force modifying hydraulic system operative to sense a deviation from said chosen datum load-supporting force to operate to cause said deviation to tend towards zero, the passive system including a first piston disposed in a first cylinder and having one face of the piston exposed to a working fluid of the resilient connection and the other face pneumatically loaded for exerting on the connection the chosen datum force, the active system including in a second cylinder a second piston connected to the first piston and having opposite faces, and means for applying a hydraulic fluid to an appropriate one of the second piston faces as determined by the nature of a deviation sensed in the chosen datum force.

3,946,560

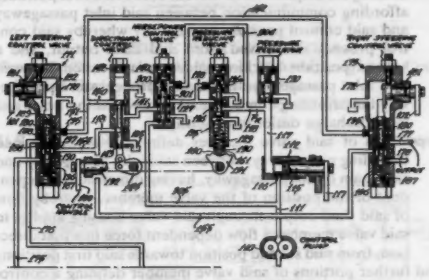
HYDROSTATIC TRANSMISSION CONTROL

Donald J. Mac Intosh, and Edward L. Stout, both of Ames, Iowa, assignors to Sundstrand Corporation, Rockford, Ill.

Continuation of Ser. No. 442,190, Feb. 13, 1974, abandoned. This application Mar. 17, 1975, Ser. No. 559,301

Int. Cl.² F16H *39/46*

U.S. Cl. 60—421 18 Claims



1. A dual path hydrostatic transmission control for two hydrostatic transmissions each having a pump, a motor, and pressure-responsive displacement control means for one of the pump and motor comprising a first valve for establishing a control pressure for said two transmissions, a second valve for setting a direction of operation of said two transmissions, a single control member for operating both said first and second valves, a fluid circuit including said first and second valves and having two branch circuits downstream of said first and second valves with each branch circuit having one of said pressure-responsive displacement control means for the pump and motor, and a pair of steering control valves positioned one in each of said branch circuits for modifying the control pressure to affect action of said hydrostatic transmissions relative to each other.

3,946,561

FLUID PRESSURE CONTROL DEVICES

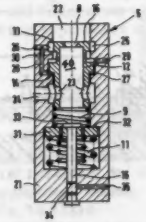
Josef Riedhammer, Ulm, Germany, assignor to Hydromatik GmbH, Ulm, Germany

Filed Dec. 23, 1974, Ser. No. 535,166

Claims priority, application Germany, Dec. 27, 1973, 2364814

Int. Cl.² F16H *39/46*

U.S. Cl. 60—445 8 Claims



1. A fluid pressure control device, for regulating operation of a hydraulic transmission system which includes first and second hydraulic machines, being respectively a hydropump and a hydromotor connected to be driven by a fluid output from the hydropump, one of which machines is provided with pressure sensitive adjustment means arranged to adjust operation of the machine in dependence upon a control pressure applied to the adjustment means, said device comprising:

a. a hollow valve housing having (i) an inlet passageway, for connection to receive said fluid output from the hydropump, (ii) a main outlet passageway, for connection to deliver said fluid output to the hydromotor, (iii) a control pressure passageway for connection to said adjustment means to apply thereto said control pressure and (iv) a discharge outlet passageway;

b. a displaceable valve member accommodated in said housing for displacement therein between a first position, affording communication between said inlet passageway and said control pressure passageway whereby said control pressure is derived from said fluid output, and a second position blocking said communication between said inlet passageway and said control pressure passageway but affording communication between the latter and said discharge outlet passageway;

portions of said valve member defining a predetermined throttling passageway, between said inlet passageway and said main outlet passageway, having dimensions independent of the position of the valve member, whereby flow of said fluid output through said valve housing applies to said valve member a flow dependent force in a first direction, from said second position towards said first position; and further portions of said valve member defining a control surface facing substantially in said first direction and arranged to be subject to the action of fluid at said control pressure thereby to act against said flow dependent force;

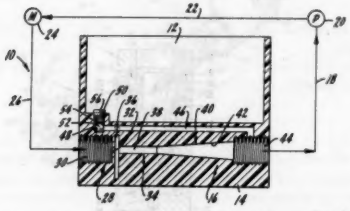
c. variable resilient biasing means arranged to apply to said valve member relative to said valve housing a biasing force in a second direction, opposite to said first direction, said biasing force being variable for an equilibrium position, between said first and second positions, of said valve member in said valve housing.

3,946,562

HYDRAULIC SYSTEM CAVITATION SUPPRESSOR

Louis Ross, Des Plaines, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 7, 1974, Ser. No. 521,820
Int. Cl.² F15B *21/04*
U.S. Cl. 60—464 **12 Claims**



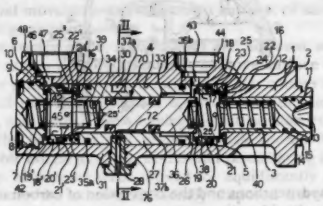
1. A fluid control device comprising an inlet section defining an orifice, an outlet section defining an expansion chamber, a mixing section intermediate said inlet and outlet sections into which fluid may be drawn by fluid flow through said orifice, and fluid bypass means communicating said inlet and outlet sections.

3,946,563

MASTER CYLINDERS FOR DUAL HYDRAULIC BRAKING SYSTEMS

Enrico Rivetti, and Giuseppe Rosso, both of Turin, Italy, assignors to Fiat societa per Azioni, Turin, Italy

Filed June 14, 1974, Ser. No. 479,377
Claims priority, application Italy, June 14, 1973, 68751/73
Int. Cl.² F15B *7/00*
U.S. Cl. 60—535 **1 Claim**



1. A master cylinder for a dual hydraulic braking system for vehicles, comprising:

a cylinder having one end closed and one end open,

means defining first and second bore sections within the cylinder,

a first piston slidably mounted in the first bore section,

a tubular element fixedly secured in the second bore section,

a second piston slidably mounted in said tubular element,

a first reaction spring interposed between the first piston and the second piston,

a second reaction spring interposed between the closed end of the cylinder and the second piston, said reaction springs maintaining both pistons in normal positions spaced from the closed end of the cylinder,

the said pistons defining with the internal walls of the cylinder two compression chambers,

duct means in the cylinder for connecting each compression chamber with a respective brake fluid reservoir and with respective brake actuators,

valve means carried by each piston for interrupting, by operation of a brake pedal, communication between the respective compression chambers and the respective reservoirs to allow brake fluid to be pressurized by the respective pistons to operate the respective brake actuators,

two spaced apart external peripheral seals carried by the second piston,

means defining a peripheral annular groove in said second piston between said two seals, said groove defining an annular auxiliary chamber, and a radial through hole in said tubular element and said cylinder communicating with the outside and in constant communication with the said auxiliary annular chamber in any axial position of the said second piston.

3,946,564

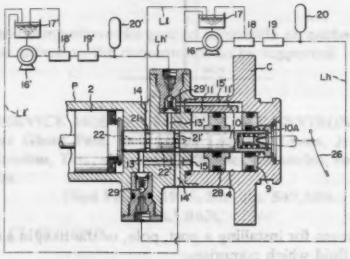
OIL-HYDRAULIC SERVO-MOTOR

Tadao Nakagawa, Ueda, Japan, assignor to Nisshin Kogyo Kabushiki Kaisha, Ueda, Japan

Filed Sept. 17, 1974, Ser. No. 506,901
Claims priority, application Japan, July 19, 1974, 49-83644
Int. Cl.² F01K *17/00*
U.S. Cl. 60—548 **2 Claims**

1. An oil-hydraulic servo-motor comprising a power cylinder with an output piston slidably fitted therein, a control casing connected to the rear end of said power cylinder and having a cylindrical bore aligned therewith, an abutment piston slidably fitted in said cylindrical bore and defining a fixed-pressure chamber therein on the front side of said abutment piston, a control piston slidably fitted through said abutment piston and through a boundary wall separating the inter-

ior space of said power cylinder and said chamber in said casing, said control piston having its front end face presented to said interior space of the power cylinder in aligned opposite relation to the rear end face of said output piston in said power cylinder, an abutting shoulder formed around said control piston at the rear end thereof for abutting engagement with said abutment piston upon movement of said control piston to a predetermined advanced position, a high-pressure and a low-pressure fluid port, both formed in said boundary wall and opening into an axial bore formed therein to slidably receive said control piston at points axially offset from each other, a fluid conduit formed in said control piston and opening at one end into said interior space of the power cylinder, said fluid conduit communicating at the other end thereof with said



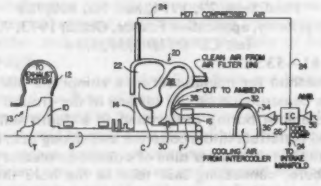
low-pressure fluid port when said control piston is in its fully retracted position, and with said high-pressure fluid port when said control piston is in said advanced position, a source of oil pressure connected with said chamber and with said high-pressure fluid port, an oil reservoir connected with said low-pressure fluid port, and an oil-pressure circuitry formed in two circuit systems, operable simultaneously and independently of each other, each system including circuit components respectively corresponding to said oil source, said reservoir, said fluid ports and said fluid conduit, further comprising a free piston slidably fitted in said cylindrical bore in the casing and over said control piston to divide said chamber into two sections to each of which said oil source is connected in the corresponding one of said circuit systems.

3,946,565

INTERCOOLER FAN AND COMPRESSOR CONSTRUCTION

John Frederick Cutler, Indianapolis, Ind., assignor to Wallace Murray Corporation, New York, N.Y.

Filed Aug. 29, 1974, Ser. No. 501,805
Int. Cl.² F02B 29/04
U.S. Cl. 60—599 **8 Claims**



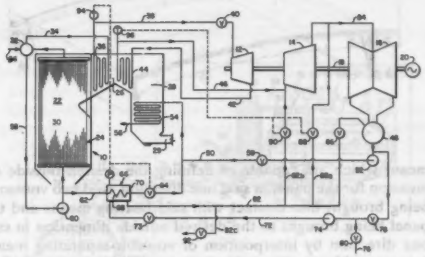
1. A turbocharger compressor of the centrifugal type and adapted to be driven by exhaust gases from the exhaust manifold of an internal combustion engine, a turbine rotor and a compressor rotor connected to and axially spaced from each other along a rotor shaft, said turbine rotor adapted to be driven by exhaust gases, compressor input and output chambers contiguous to said compressor rotor, the improvement comprising, a fan rotor coupled to and axially located along said rotor shaft at a point different from the axial locations of said turbine and compressor rotors, a duct surrounding said fan, said duct being open at one end thereof to ambient, a seal surrounding said rotor shaft to preclude mixing between gases passing through the compressor and gases passing through the duct, whereby rotation of said fan rotor causes a pressure differential and consequent air flow in the duct.

3,946,566

TURBINE START-UP SYSTEM

Frank William Hochmuth, Hudson, Canada, assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 16, 1974, Ser. No. 533,108
Int. Cl.² F01K 13/02
U.S. Cl. 60—646 **17 Claims**



1. In a power plant system comprising turbine means for driving a prime mover and a vapor generator for supplying high pressure, superheated vapor to said turbine means by the transfer of heat from the heat input to said vapor generator, said vapor generator including a flow circuit having an evaporator for converting liquid to saturated vapor, a boiler drum operatively connected to said evaporator for separating liquid from the saturated vapor delivered to said drum and for recirculating the separated liquid through said evaporator means for supplying liquid to be vaporized to said vapor drum and a superheater operatively connected to said boiler drum for heating the vapor separated therein, the method of increasing the temperature of vapor heated in said superheater under the influence of a relatively constant heat input to said vapor generator comprising:

a. diverting a regulated portion of the liquid from said vapor generator flow circuit upstream of said evaporator;
b. extracting a regulated amount of heat from said diverted liquid portion to subcool the same; and
c. mixing said subcooled diverted liquid portion with the liquid admitted to said boiler drum whereby the amount of vapor passed to said superheater is reduced.

3,946,567

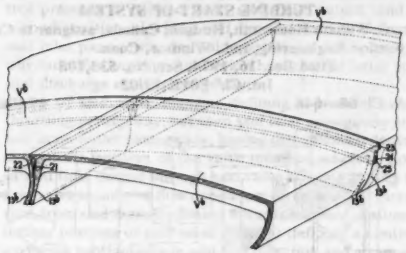
VOUSSOIR FOR A LINING, AND METHOD FOR CONSTRUCTING THE LINING

Jacques Francois Oger, Pont-A-Mousson, France, assignor to Pont-A-Mousson S.A., Pont-A-Mousson, France

Filed Feb. 12, 1974, Ser. No. 441,927
Claims priority, application France, Feb. 19, 1973, 73.05727; Jan. 31, 1974, 74.03310
Int. Cl.² E21D 11/22
U.S. Cl. 61—45 R **15 Claims**

1. A method for constructing a bore lining from elementary voussoirs comprising pre-assembling the voussoirs into panels in the factory by means of a voussoir connecting material interposed between the voussoirs and capable of maintaining the voussoirs assembled, each one of the panels comprising at least two voussoirs which are in adjacent relation and interconnected by said connecting material in at least one of circumferential and axial directions and, after transfer of the

panels to the construction site, directly laying the pre-assembled panels in the bore so as to form the lining, the pre-assembly of said two voussoirs comprising starting with two voussoirs whose lengths in said one direction are such that if the two voussoirs were put in direct contact with each other in said one direction the outside dimension of the two contacting voussoirs would be less than the desired outside dimension of the panel, placing said two voussoirs in adjacent relation in said one direction in a jig comprising two opposed bearing



means which are capable of defining the desired outside dimension for the panel in said one direction, said two voussoirs being brought into contact with said bearing means and the panel being brought to the desired outside dimension in said one direction by interposition of voussoir-separating means between said two voussoirs so as to urge said two voussoirs in said one direction against said two bearing means, and interposing said connecting material in a gap formed between said two voussoirs thus urged against said two bearing means.

3,946,568

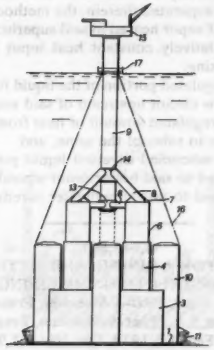
OFFSHORE OIL PRODUCTION PLATFORM

Sigurd Heien, Aslokkvn. 82, 1362 Billingstad, Norway

Filed Mar. 24, 1975, Ser. No. 561,376

Int. Cl.² E02D *21/00;* **B63B** *35/44*

U.S. Cl. 61—46.5 **6 Claims**



1. Offshore oil production platform comprising a first section disposed on the sea bed and a second section connected to the first section and projecting up above the sea surface, the first section consisting of a plurality of interconnected prefabricated units of steel or concrete and comprises at least one tank which is divided into a plurality of compartments, characterized in that the tank in the first section has a peripheral wall the thickness of which is not adapted to withstand water pressure with the tank empty and submerged, and at least one compartment in the tank has a peripheral wall the thickness of which is adapted to withstand full water pressure when empty and submerged.

3,946,569

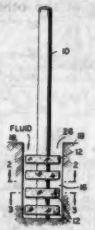
METHOD AND MEANS FOR INSTALLING A POST

Ivan L. Stuber, 1026 N. Lightner, Wichita, Kans. 67208

Continuation-in-part of Ser. No. 487,543, July 11, 1974, abandoned. This application Mar. 3, 1975, Ser. No. 554,409

Int. Cl.² E02D *5/80;* **E04H** *17/22*

U.S. Cl. 61—53.5 **24 Claims**



1. A means for installing a post, pole, or the like, in a hole having a fluid which comprises;

a plurality of bracelet members attached to the post;

a covering over each of said bracelet members, said covering having a protective coating that will dissolve in the fluid after a predetermined time has elapsed; and

elastomeric means in said bracelet members for expanding, said elastomeric means encased in said covering, said elastomeric means when coming into contact with the fluid expanding to hold the post firmly in place in the hole.

9. A process for installing a post, pole, or the like, in a hole having a fluid in order to mount a fence, a sign, or the like, on the post, which comprises attaching a plurality of bracelet members to said post as same is being placed into said hole, each of said bracelet members include a covering and an elastomeric means for expanding said means for expanding being encased in said covering and expanding said bracelet members to secure the post in the hole.

3,946,570

SUPPORT AND FOUNDATION COMPOSITE PILE FOR VARIOUS WORKS AND METHOD FOR MANUFACTURING THE SAME

Pierre Henry Freydier, Garches, France, assignor to S.E.F.I. Sondages-Etanchements-Forages-Injections, Viry-Chatillon, France

Filed Sept. 27, 1974, Ser. No. 509,932

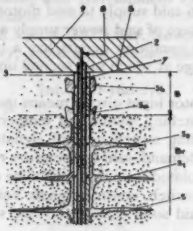
Claims priority, application France, Oct. 2, 1973, 73.35191

Int. Cl.² E02D *5/38, 5/54*

U.S. Cl. 61—53.52 **9 Claims**

1. A method for manufacturing a composite pile for supporting a construction on the surface of the ground comprising the steps of boring the ground to a depth sufficient to reach and penetrate into a coherent and strong bed, introducing into the bore a strainer tube of a diameter smaller than that of said bore, connecting said tube to the bore through an injection of sheath grout, connecting said tube and said sheath grout to the surrounding ground through superposed injections of an anchor grout made on the lower portion of the tube and sheath grout located in the good ground and by at least one injection of a cohesion grout impregnating the upper bed of the surrounding ground, said injections being made through injection holes disposed in said strainer tube, placing a reinforcement part inside said tube, introducing in said tube a

sealing grout for the reinforcement part, and forming the end portion of the tube, of the reinforcement part and the sealing



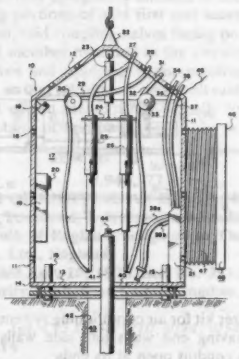
grout raising above the ground to provide an anchorage head to be affixed to the construction to be supported.

3,946,571

SERVICE MODULE FOR HOSTILE ENVIRONMENT

Oscar Glenn Pate, and Angus Loughlin Lyons, Jr., both of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Feb. 6, 1975, Ser. No. 547,850
Int. Cl.² B63C *11/44*
U.S. Cl. 61—69 R **13 Claims**



1. Apparatus for providing a sheltered work area over a borehole in the ground surface, said apparatus comprising:

structural means providing an enclosed work area and having vertical support members having wall sections jointed together and adapted to retard the flow of heat therethrough;

roof means joined to said wall sections and being adapted to retard the flow of heat therethrough;

floor means joined to the lower portion of said wall sections and adapted to retard the flow of heat therethrough, said floor means having an opening passing therethrough of sufficient size to expose an underground borehole below said apparatus to said enclosed work area;

entrance means in at least one of said wall sections arranged to provide ingress and egress to said work area by workmen;

access means passing through said structural means and adapted to provide one or more openings into said work area through which power and material supply tubes may pass; and,

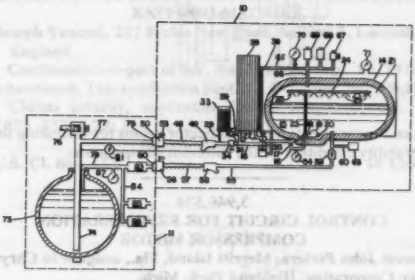
a grouting system having power actuated raising and lowering means, telescopic tubular grouting means, and means for supplying fluids and solid grouting material to said grouting means.

3,946,572

APPARATUS FOR TRANSFERRING CRYOGENIC LIQUID FROM ONE DEWAR TO ANOTHER

Kenneth R. Bragg, Redondo Beach, Calif., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Sept. 26, 1974, Ser. No. 509,677
Int. Cl.² F17C *7/02*
U.S. Cl. 62—50 **17 Claims**



1. Apparatus for filling a first dewar with a liquid, said apparatus comprising a second dewar having a lower portion adapted to contain a supply of the liquid and having an upper portion to provide a vapor space above the liquid supply, means entirely within the second dewar for circulating liquid from the lower portion to the upper portion for equalizing temperatures in said upper and lower portions, said circulating means including a conduit connected to the discharge side of a pump, said pump having its intake communicating with said lower portion, conduit means also connected to the discharge side of the said pump and having means thereon for connection to the first dewar whereby liquid may be delivered from the second dewar through the conduit to the first dewar, and means associated with the conduit means for adding heat to the liquid therein.

3,946,573

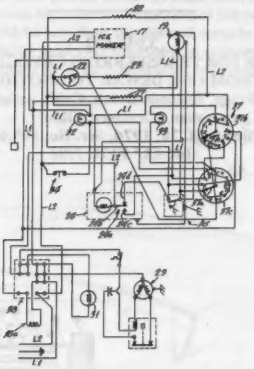
ELECTRICAL DIAGNOSTIC SYSTEM FOR REFRIGERATION APPARATUS

Duane C. Nichols, and Samuel J. Pearson, both of Evansville, Ind., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Aug. 22, 1974, Ser. No. 499,970
Int. Cl.² F25B *49/00*
U.S. Cl. 62—126 **15 Claims**

1. In a refrigeration apparatus having a plurality of electrical components, apparatus for selectively indicating the operability condition of the components, comprising testing control means carried by said apparatus including selector switch means and circuit means interconnecting said switch means and one of said electrical components to cause said one com-

ponent to define an indicator means for selectively (a) causing normal operation of the apparatus, or (b) separately connecting said components to said indicator means for indicating the operability condition of the different components.

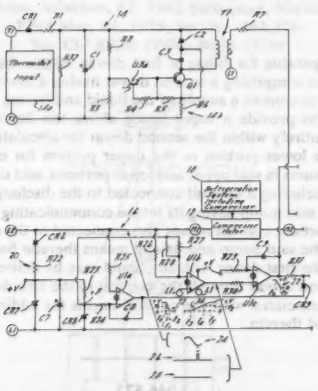


3,946,574

CONTROL CIRCUIT FOR REFRIGERATION COMPRESSOR MOTOR

Vincent John Portera, Merritt Island, Fla., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Feb. 7, 1975, Ser. No. 547,897
Int. Cl.² H02H 7/06; F25B 49/00
U.S. Cl. 62—158 **19 Claims**



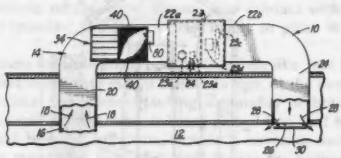
1. In combination:
a refrigeration system for providing cooling to a medium to be cooled including an electrical compressor motor;
an electrical power supply;
motor input circuit means operatively coupling said supply with said motor comprising means for controllably conducting current from said supply to said motor in accordance with the temperature of said medium;
under-voltage sensing means operatively coupled with said motor input circuit means to sense the voltage of said supply, said under-voltage sensing means comprising means responsive to a first under-voltage condition of said supply for providing a control signal in time delayed relation to occurrence of the condition, means responsive to a second undervoltage condition of said supply for providing said control signal substantially contemporaneously with occurrence of said second condition;
means responsive to said control signal for inhibiting current flow from said supply to said motor;
wherein the voltage of said power supply at which said first under-voltage condition occurs has a larger magnitude than the voltage at which said second under-voltage condition occurs;
wherein said motor input circuit means includes solid state electronic switching means and temperature responsive means providing switch control signals in accordance with cooling demand, said temperature responsive means being D. C. isolated from said solid state electronic switch means, said switch control signals being magnetically coupled to said solid state electronic switching means; and
including photocoupler means interlocking said undervoltge sensing means with said temperature responsive means for preventing generation of said switch control signals when said control signal is given by said undervoltage sensing means.

3,946,575

ECONOMIZER KIT FOR AIR CONDITIONING SYSTEMS

Russell L. Barr, 10803 El Arco Drive, Whittier, and Samuel J. Affronte, 11951 Easy Way, Garden Grove, both of Calif. 90603

Filed Jan. 24, 1975, Ser. No. 543,900
Int. Cl.² F25D 17/04
U.S. Cl. 62—176 **6 Claims**



1. An energizer kit for air conditioning systems, comprising:
a housing having end walls and side walls said housing defining a conduit open at its ends;
a partition in an outer end portion of said conduit, said partition extending longitudinally part-way into the conduit to define with adjacent side walls and end walls respectively and inlet passage from ambient atmosphere and an outlet passage to ambient atmosphere, the opposite end of said conduit being a by-pass passage one part of which comprises an inlet chamber and the other part comprising an outlet chamber;
a movable damper within the housing;
pivot means for said damper, after pivot means being located at the inner end of the partition;
means for pivotly actuating the damper between a position closing the inlet passage and a position separating the inlet and outlet chambers of the by-pass passage;
normally closed means between the outlet passage to ambient atmosphere and the inlet chamber for automatically relieving pressure in the inlet chamber to atmosphere when the inlet chamber pressure is above a predetermined value;
and temperature control means for controlling the actuating means for the movable damper in accordance with ambient temperature.

3,946,576
FLEXIBLE COUPLING

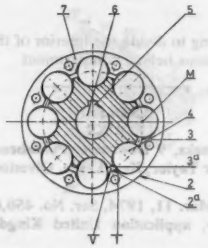
Carl Eric Johansson, Blaricum, Netherlands, assignor to SKF Industrial Trading and Development Company B.V., Jutphaas, Netherlands

Filed Apr. 4, 1973, Ser. No. 347,738

Claims priority, application Netherlands, Apr. 7, 1972, 7204642

Int. Cl. F16d *3/17*

U.S. Cl. 64—11 R **6 Claims**



1. A flexible coupling comprising first and second coupling halves, a portion of said first coupling half projecting into said second coupling half, said coupling halves having facing portions defining a plurality of spaces therebetween, elastic means substantially completely encased in the spaces defined by said facing portions of said first and second halves along said projection, said coupling halves facing portions including a ring shaped member mounted in the circumference of said coupling halves and applying a compressive force to said elastic means so that said elastic means fill said spaces, therein enabling said elastic means to be equally loadable in both rotating directions of said coupling.

3,946,577
METHOD OF KNITTING AN ELASTICISED WELT

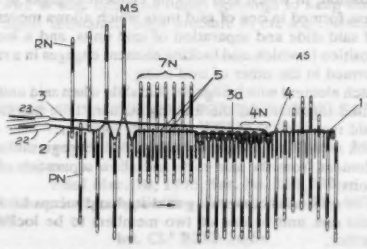
Keith Gerald Townsend, Aylestone, and Frederick Keel, Narborough, both of England, assignors to The Bentley Engineering Co. Ltd., England

Filed Apr. 16, 1973, Ser. No. 351,585

Claims priority, application United Kingdom, Apr. 18, 1972, 17815/72

Int. Cl.² D04B *9/10, 9/24, 9/54*

U.S. Cl. 66—14 **6 Claims**



1. A method of knitting, on a circular knitting machine having first and second knitting stations at which needles of the machine can be actuated in the knitting mode, a succession of tubular articles each having an elasticized roll-welt, comprising the following steps:

a. knitting an article with ground yarn on the knitting machine;

b. on completion of the article, pressing-off the article from the needles of the machine at the second knitting station;

c. before the pressing off is completed, knitting an end of an elastic yarn into a portion of the final course of the article at the first knitting station;

d. before the end of elastic yarn is pressed-off at the second knitting station, commencing the setting-up of a fresh course for knitting a roll-welt of the next succeeding article; and

e. after the pressing-off of the end of the elastic yarn at the second knitting station, temporarily retaining the elastic yarn in position and laying the elastic yarn into the roll-welt of the said next succeeding article as it is set up and knitted at the first knitting station.

3,946,578
DETECTION OF DEFECTIVE KNITTING NEEDLES OF A KNITTING MACHINE

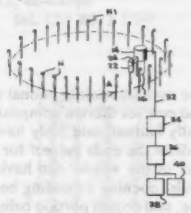
Joseph Venczel, 227 Eccles New Road, Salford 5, Lancashire, England

Continuation-in-part of Ser. No. 505,690, Sept. 13, 1974, abandoned. This application Sept. 17, 1974, Ser. No. 506,894

Claims priority, application United Kingdom, Sept. 18, 1973, 43704/73; Feb. 9, 1974, 6002/74

Int. Cl.² D04B *15/08*

U.S. Cl. 66—157 **18 Claims**



1. A needle detector for a circular knitting machine comprising a circular array of knitting needles advancing along a circular path, comprising first and second photoelectric means, said first photoelectric means being disposed at a higher vertical position than said second photoelectric means, a light source arranged to direct a beam of light onto both said photoelectric means, an arc of said circular path passing between the light source and the photoelectric means such that when the needles are advanced along said path each passes in succession through the beam and casts a shadow of the end of the needle having the hook onto the first photoelectric means and casts the shadow of at least part of the shank of the needle or a jammed closed needle latch on the second photoelectric means, the beam being directed so that when a needle with an intact hook and open latch enters the beam, the shadow of the hook is cast on the first photoelectric means before the shadow of any other part of the needle is cast on the second photoelectric means and if the hook is broken off a shadow of the shank is cast on the second photoelectric means before any shadow of the needle is cast on the first photoelectric means, and the direction of said beam being such that if the latch is jammed closed a shadow of the latch is cast on the second photoelectric means before any shadow of the needle is cast on the first photoelectric means, control means connected to said photoelectric means whereby first and second electric signals are supplied by said photoelectric means to said control means corresponding to shadows cast on the first and second photoelectric means respectively when the machine is in use, and said control means including means to initiate stopping of the machine and/or operation of warning

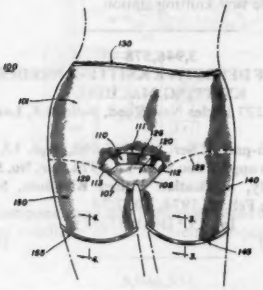
means, when for a said needle passing through the beam, a said second signal appears before a said first signal.

3,946,579

ONE-PIECE PANTY AND METHOD OF MANUFACTURE

Richard H. Heinig, Fayetteville, Ark., assignor to Bear Brand Hosiery Co., Chicago, Ill.

Filed Dec. 10, 1973, Ser. No. 423,072
Int. Cl.² A41B 9/02, 9/04, 9/10
U.S. Cl. 66—177 9 Claims



1. A one-piece seamless unidirectional rotary knitted panty having wales and courses therein comprising a seamless tubular body integrally knitted, said body having a waist opening therein intermediate the ends thereof for receiving the lower part of the trunk of the wearer and having a crotch portion opposite said waist opening extending beneath the crotch of the wearer in use, said crotch portion being knit with a density substantially greater than that of the surrounding areas and being relatively stretchless to provide a reinforced area in said body, said seamless body having seamless downwardly depending legs integrally knit therewith on the ends thereof, the ends of each of said legs having integrally knitted thereon a seamless leg band turned upon itself and integrally knitted with itself to provide a double thickness at each of said leg bands, said body in the portions other than said crotch and said legs and said leg bands being knit with a tuck knit pattern, said leg bands being knitted with at least certain of the courses therein of elastomeric yarn so as to impart an elastic character to said leg bands, one of said leg bands being integrally knit at the make up end of said body and the other of said leg bands being integrally knit at the run off end of said body, said panty comprising a single continuous seamless knitted tube forming the body and the legs and the leg bands with all the knitted wales of said leg bands and said legs extending through said leg bands and said legs into said body and with the knitted courses extending circumferentially of said tube.

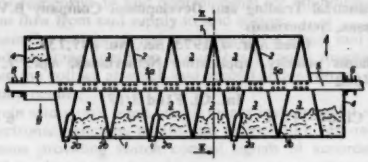
3,946,580

WASHING MACHINE DRUM SHAVING ROTARY FEED WORM

Karl-Heinz A. Stoll, Sprendlingen, Germany, assignor to Voswerke GmbH, Sarstedt, Germany

Filed Mar. 25, 1971, Ser. No. 128,066
Int. Cl.² D06F 37/08
U.S. Cl. 68—145 4 Claims

1. In a washing machine
an external rotary drum casing,
a feed worm within and rigid with the casing, and
a tubular, drum support, shaft having apertures therein for the delivery of fluids to the interior of the drum,



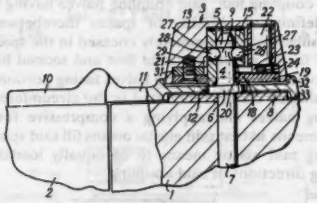
said worm serving to divide the interior of the drum casing into a continuous helical compartment.

3,946,581

LOCKS

Wilfred Gwyn Weeks, 9 Downside, Portishead, Bristol, and Malcolm Arthur Taylor, New Leaze, Olveston, Bristol, both of England

Filed Mar. 11, 1974, Ser. No. 450,066
Claims priority, application United Kingdom, Mar. 14, 1973, 12354/73
Int. Cl.² E05B 65/48, 67/30
U.S. Cl. 70—6 10 Claims



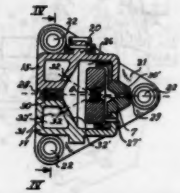
1. A lock assembly comprising two separable units having respectively a stud and a bore to receive the stud, which assembly comprises:
a slide which is carried by one of said units for limited sliding movement relatively thereto and which occupies a space between said stud and a side of said bore when said units are fitted together:
at least one locking element which is movable in a transverse through opening formed in said slide from a release position, in which said locking element engages in a recess formed in one of said units which allows movement of said slide and separation of said units, and a locking position in which said locking element engages in a recess formed in the other of said units;
a catch element which engages said slide when said units are fitted together and the locking element is in the second said recess so as to lock said units together;
a lock which is operable by a key to disengage said catch element from the said slide and allow separation of said units:
one of said units comprising said stud and means for fixing said one unit to one of two members to be locked together,
the other of said units comprising a body in which said passage is formed, and including said slide, at least one ball forming said locking element, said catch element and said key-operated lock; and
said catch element comprising a pawl which is pivoted to said body, a bottom plate secured to the under side of said body for limiting the movement of said slide out of said body.

3,946,582

DIESTOCK FOR WIREDRAWING

Piero Pietroni, Ascoli Piceno, Italy, assignor to Technofil S.p.A., Italy

Continuation-in-part of Ser. No. 319,152, Dec. 29, 1972, abandoned. This application Oct. 23, 1974, Ser. No. 517,304
Claims priority, application Italy, Dec. 31, 1971, 33198/71
Int. Cl.² B21C 9/00
U.S. Cl. 72—45 4 Claims



1. A diestock for wire drawing, comprising:

a die having an inlet cone receptive of a wire of a first diameter and having an outlet cone disposed to discharge the wire thinned to a second and smaller diameter by drawing it through the die;

a housing which encloses and fixedly supports the die and defines a die chamber around the die in which the die and its inlet and outlet cones are exposed;

means for keeping the die chamber filled with pressurized, cool lubricant liquid by feeding such liquid into the die chamber to keep the die and both the exposed inlet and outlet cones thereof immersed in such liquid; and

means defining restricted, elongate wire inlet and outlet openings in the housing, opposite to and axially aligned with the inlet and outlet cone, respectively, said wire inlet and outlet openings providing the only communication, in the use of the diestock for wire drawing, between the die chamber and the space outside the housing, said wire inlet and outlet openings having sliding fit, respectively, with the wire of the first diameter and with wire thinned to the second and smaller diameter, each of said wire inlet and outlet openings being elongate to extend over a length substantially greater than the respective diameter of the wire, thereby providing a path for the pressurized liquid outwardly from the die chamber only through the narrowly restricted spaces left by said sliding fit of the wire in said inlet and outlet openings to keep the liquid under substantial back pressure in the die chamber.

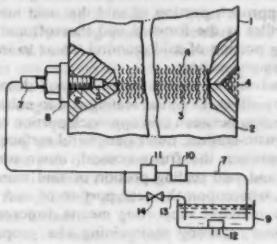
3,946,583

METHOD AND APPARATUS FOR IMPROVING FATIGUE STRENGTH IN WELD ZONES

Saburo Usami, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 20, 1975, Ser. No. 560,208
Claims priority, application Japan, Mar. 20, 1974, 49-31869
Int. Cl.² B21D 26/04
U.S. Cl. 72—54 9 Claims

1. A method for improving the fatigue strength in a welded metal structure defined by two metal parts having adjacent surfaces partly welded by depositing weld metal therebetween and partly unwelded between their adjacent surfaces, with the transition from the welded part to the unwelded part representing a fatigue strength stress concentration zone, which method comprises the steps of: feeding a fluid under pressure into the clearance between the unwelded adjacent surfaces of the two parts to locally yield the metal at the stress concentration zone; and thereafter removing the pressurized fluid so that the welded metal structure may be put into practical use.

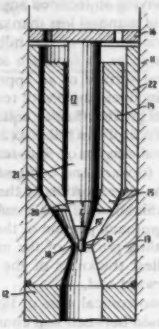


3,946,584

HYDROSTATIC EXTRUSION METHOD AND APPARATUS

Tatsuo Yamasaki, Kobe; Hideaki Ide, Akishi; Yoshihiro Yamaguchi, Ashiya; Tomiharu Matsushita, Nishinomiya, and Yuuzi Nakahara, Osaka, all of Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Filed Apr. 11, 1974, Ser. No. 460,172
Claims priority, application Japan, Apr. 11, 1973, 48-41104; June 4, 1973, 48-63508
Int. Cl.² B21J 5/04
U.S. Cl. 72—60 19 Claims



1. A hydrostatic extrusion method for tubes, wherein an annular billet is hydrostatically extruded through an annular interstice defined between the bearing portion of a die and the sizing portion of a mandrel, comprising the steps of:

preparing the nose or tip portion of said billet so as to have frusto-conical, inner and outer peripheral surfaces therefor, said frusto-conical inner peripheral surface of said billet having an inclined angle with respect to the axial line of said mandrel greater than or equal to that of a conical sealing portion of said mandrel, said frusto-conical outer peripheral surface of said billet having an inclined angle with respect to the axial line of said mandrel less than or equal to that of an approach portion of said die defining the die cavity, the inner diameter of said nose portion of said billet at its forward end being larger than the diameter of said sealing portion of said mandrel at its forward end and the smallest thickness of the nose portion of the billet along its length being larger than the thickness of the annular interstice defined between the bearing portion of the die and the sizing portion of the mandrel;

inserting said billet into a container of an extruder;

advancing said mandrel into the hollow central portion of said billet so as to effect a preliminary sealing between said approach portion of said die, said nose portion of said billet at the forward end thereof, and said conical sealing portion of said mandrel, so as to insure positive preliminary sealing;

further advancing said mandrel a small distance so as to thereby effect the initial sealing and to enhance the positive sealing between said approach portion of said die and said frusto-conical, outer peripheral surface of said billet and between the frusto-conical, inner surface of said billet and said sealing portion of said mandrel, respectively, whereupon the rear portion of said mandrel will abut a mandrel supporting means disposed within said container, thereby maintaining the proper positional relationship between said bearing portion of said die and said sizing portion of said mandrel; and

extruding said billet through said annular interstice defined between said bearing portion of said die and said sizing portion of said mandrel.

9. Apparatus for hydrostatically extruding tubes from an annular billet adapted to be interposed between a die and a mandrel, the nose or tip portion of the billet being frusto-conical in configuration and including inner and outer peripheral surfaces, comprising:

a container;

a die disposed within said container and including a bearing portion; and

a mandrel disposed within said container and including a sizing portion which cooperates with said bearing portion of said die so as to define therebetween an annular interstice through which said tubes are extruded;

the outer peripheral surface of a conical sealing portion of said mandrel having an inclined angle with respect to the axial line of said mandrel less than or equal to that of the inner peripheral surface of the billet to be used within said apparatus so as to facilitate sealing therewith, the inner peripheral surface of an approach portion of said die having an inclined angle with respect to the axial line of said mandrel greater than or equal to that of the outer peripheral surface of the billet so as to facilitate sealing therewith, the diameter of said sealing portion of said mandrel at its forward end being smaller than the inner diameter of the nose portion of the billet at its forward end, and the thickness of the annular interstice defined between the approach portion of the die and the forward end of the sealing portion of the mandrel being smaller than the smallest thickness of the nose portion of the billet at its forward end,

whereby the frusto-conical nose or tip portion of the billet will be interposed between said conical sealing portion of said mandrel and said approach portion of said die at a position substantially upstream of said extrusion interstice.

3,946,585

DEVICE TO BE APPLIED TO A LATHE FOR SPINNING

Vittorio Caboni, Via Casteggio n.10-, Turin, Italy

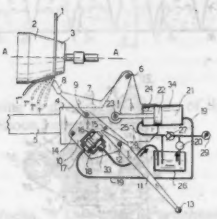
Filed Dec. 30, 1974, Ser. No. 537,189

Claims priority, application Italy, Jan. 3, 1974, 67002/74

Int. Cl.[2] B21D *22/16*

U.S. Cl. 72—83 **7 Claims**

1. A device to be applied to a lathe for spinning, said device comprising a motor driven carriage, means for guiding said carriage along a path that is substantially parallel to the lathe axis, a tool-supporting arm mounted on said carriage, a lever pivotally connected at one end thereof to said arm, said lever being adapted to be manipulated by the operator, an hydraulic cylinder linked to the other end of said lever whereby the action of said cylinder on said tool-supporting arm is proportional to the force exerted by the manipulation of said lever, the pressure within said chamber of said cylinder and the outlet of fluid therefrom determining the thrust exerted by said cylinder on said tool-supporting arm, there being further included a valve having a sliding piston through which said lever transmits the force exerted by the operator to said arm, said valve also including an inlet port that is coaxial with said



piston thereof, said inlet port communicating with said chamber of said hydraulic cylinder in order to regulate the pressure in said chamber thereof and the outlet of fluid therefrom whereby, as a result of the force exerted by said operator, said piston progressively throttles said inlet port in a direction against the pressure of the incoming fluid.

3,946,586

PROCESS AND APPARATUS FOR ROLLING SEAMLESS TUBES

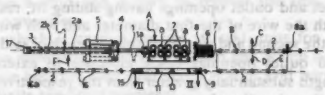
Jean Paul Calmes, Lausanne, Switzerland, assignor to Innocenti Santeustacchio S.p.A., Brescia, Italy

Division of Ser. No. 435,397, Jan. 21, 1974, abandoned. This application Jan. 15, 1975, Ser. No. 541,310

Claims priority, application Italy, Jan. 23, 1973, 19495/73

Int. Cl.[2] B21B *25/04*

U.S. Cl. 72—201 **7 Claims**



1. Apparatus for use in rolling seamless tubes, comprising: a train of rolls defining a tube rolling axis; a mandrel adapted to be inserted into a hollow bloom to be rolled, and mandrel restraining and displacing means engageable with the head of the mandrel for controllably displacing the mandrel along the tube rolling axis, wherein the improvement consists in:

a mandrel return path, spaced laterally from and substantially parallel to the tube rolling axis;

return means for displacing said mandrel in an upstream direction along said return path after it has passed through the train of rolls during a rolling stage, and

mandrel cooling means in said return path for cooling the mandrel as it moves along said return path comprising a water cooling bath extending parallel to and side-by-side with said train of rolls on said mandrel return path and conveyor means in said bath for passing the mandrel lengthwise through said bath,

whereby in operation of the apparatus said mandrel may be cooled along the return path while another said mandrel is displaced along the rolling axis during a further rolling stage.

3,946,587
ROLLING MILLS

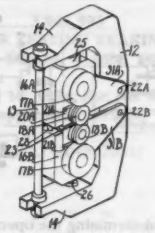
Jack Maltby, Sheffield, England, assignor to Davy-Loewy Ltd., Sheffield, England

Filed Dec. 4, 1974, Ser. No. 529,322

Claims priority, application United Kingdom, Dec. 6, 1973, 56497/73

Int. Cl.² B21B *31/08*

U.S. Cl. 72—237 **4 Claims**



1. A cantilever rolling mill stand comprising a generally C-shaped housing member; a pair of roll carrying chocks located between the protruding arms of the housing member and pivoted to the housing member about separate axes which lie parallel to the roll axes and which are displaced from the plane through the roll axes; roll gap adjustment means arranged between a first of the chocks and a first of the arms of the housing member; and further adjustment means located between the second of said chocks and the other arm of said housing member.

3,946,588
METHODS OF AND APPARATUS FOR EDGE-FORMING METALLIC PLATES

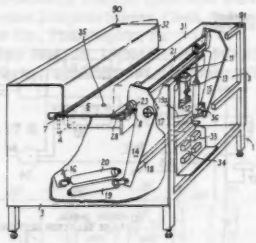
Donald Mayston, St. Albans, England, assignor to Protocol Engineering Limited, England

Filed Nov. 14, 1974, Ser. No. 523,901

Claims priority, application United Kingdom, Nov. 28, 1973, 55244/73

Int. Cl.² B21D *19/00*

U.S. Cl. 72—465 **15 Claims**



1. Apparatus for edge-forming a metallic printing plate, said apparatus comprising, in combination:

a. a supporting structure,

b. a former mounted on said supporting structure and having,

i. a surface for receiving the printing plate and

ii. at least one first die part constituted by a side edge of said former, having a portion which is inclined inwardly at an angle of greater than 90° with respect to said receiving surface,

c. means for locating the printing plate on said former with an edge thereof to be formed projecting beyond said first die part,

d. means for forming at least one bend in said projecting edge of said printing plate by bending said projecting edge around said first die part, including

i. at least one second die part comprising a pad made of a flowable resilient material and

ii. and elongate member having a channel therein in which said pad is mounted, said elongate member extending parallel to said first die part,

e. at least one pair of bell-crank levers carrying said elongate channel member therebetween, for pressing the pad against the printing plate and thus the printing plate against the former,

f. first pivot means mounting said bell-crank levers on said supporting structure to be pivotable about a substantially horizontal axis,

g. second pivot means mounting said elongate channel member on said bell-crank levers, for rotation about a substantially horizontal axis on, and with respect thereto,

h. first power means for pivoting said bell-crank levers between a position in which the said pad is pressed against said printing plate and said former adjacent the projecting edge of said printing plate to clamp said printing plate to said former, and a non-clamping position in which the pad is spaced from said printing plate,

i. second power means for rotating said elongate channel member to turn said pad around said first die part and bend the projecting edge of said printing plate around said first die part whilst said bell-crank levers press and maintain said pad in contact with the printing plate at the bending angle, and throughout the entire area, of the bend, whereby to cause the material of said pad and thus the projecting edge of said printing plate to conform to the shape of said first die part and to control the inside radius of the bend.

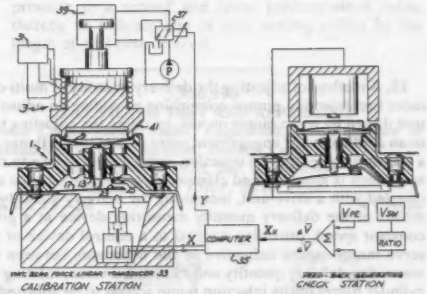
3,946,589
THERMOSTATIC DISC SEAT FORMING CALIBRATION PROCESS AND APPARATUS

Werner Strasser, Salvisa, Ky., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 10, 1973, Ser. No. 423,357

Int. Cl.³ G01K *15/00*

U.S. Cl. 73—1 F **12 Claims**



1. A method of calibrating an assembled disc-type thermostat comprising the steps of

a. heating the disc of said thermostat to cause said disc to snap,

b. measuring the gap between the contacts of the thermostat switch after the disc has snapped,

c. computing the deviation between desired gap and measured gap,

d. adjusting the disc seat position in accordance with said computer deviation and

e. measuring a function of disc velocity and switch operation upon snapping of said disc to provide an error signal and adjusting said desired air gap in step (c) in accordance with said error signal.

3,946,590

DEVICE AND A PROCESS FOR ADJUSTING THE DELIVERY QUANTITY OF MULTI-CYLINDER FUEL INJECTION PUMPS

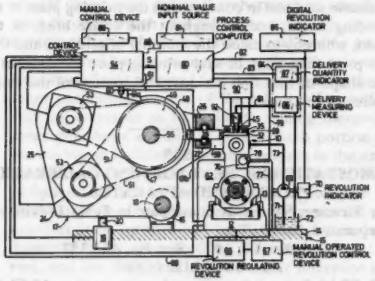
Herbert Bechstein, Esslingen; Herbert Biebl, Korb; Wolfgang Eckell, Gebersheim; Anton Franz, Markgroningen; Eberhard Hofmann, Kirchberg, Murr; Hans Stauch, Hemmingen; Heinrich Staudt, Markgroningen-Talhausen; Hellmut Tomasch, Freiberg; Alois Urlberger, Ruit, and Theodor Winnewisser, Neuhausen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Mar. 27, 1975, Ser. No. 562,860

Claims priority, application Germany, Apr. 1, 1974, 2415718

Int. Cl.² G01M 19/00

U.S. Cl. 73—1 R 17 Claims



15. A method of adjusting the delivery quantity of multi-cylinder fuel injection pumps comprising providing an adjusting tool driven by servo motor means, coupling the adjusting tool to an application or engagement point on a securing flange, or a transmission part of an injection pump sought to be adjusted and which is mounted and clamped in a clamping device and coupled with a drive unit, measuring the delivery quantity by means of the delivery quantity measuring device at a given constant speed, providing a signal to a control device of the servo motor means indicative of the difference between the measuring delivery quantity and its nominal value, rotating the cylinder barrel of the injection pump sought to be adjusted by the servo motor means via an adjusting gear, moving the adjusting tool in at least one adjusting routine until the delivery quantity is equal to the nominal value, and finally tightening screws of a securing flange holding the cylinder barrel in its test position, which screws have been turned prior to the adjustment routine with a partial torque which does not adversely effect the delivery of the pump and which permits mechanical rotation of the securing flange or of the cylinder barrel, the final tightening being effected after the adjustment routine.

3,946,591

METHOD OF AND SYSTEM FOR DETECTING THE RATE OF AN ELECTRONIC TIMEPIECE

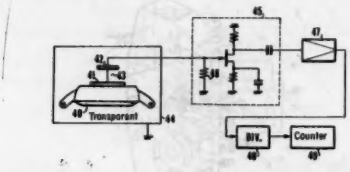
Yoshihiko Yanagawa, Musashimurayama, and Shizuo Yamaguchi, Tokyo, both of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Jan. 3, 1974, Ser. No. 430,388

Claims priority, application Japan, Jan. 10, 1973, 48-5791

Int. Cl.² G04B 17/00; G04D 7/12

U.S. Cl. 73—6 5 Claims



1. A system for determining the operating speed of a timepiece provided with an oscillator of fixed frequency, electro-optical indicator means including an exciting electrode, stepping means for said indicator means controlled by said oscillator means, and circuit means connected to said oscillator for applying to said exciting electrode an alternating voltage harmonically related to the stepping rate of said indicator means, comprising a conductive plate spacedly juxtaposed with said exciting electrode for defining therewith a coupling capacitance, a resistance connected to said capacitance for developing thereacross a voltage wave in step with said alternating voltage, amplifier means connected across said resistance, and rate-metering means connected to said amplifier means.

3,946,592

DIGITAL TIME ERROR MEASURING ARRANGEMENT

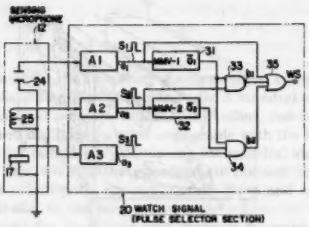
Shingo Ichikawa, Sayama, and Hiroshi Yanagawa, Tanashi, both of Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed Apr. 5, 1974, Ser. No. 458,375

Claims priority, application Japan, Apr. 9, 1973, 48-40270; May 31, 1973, 48-60320; July 13, 1973, 48-79083

Int. Cl.² G04D 7/12

U.S. Cl. 73—6 11 Claims



1. A digital time error measuring device, comprising in combination, a) first means for sensing a watch signal from a watch under test; b) second means for amplifying said watch signal and converting it tinto pulses; c) a standard oscillator for generating a series of standard clock pulses; d) a preliminary measuring means adapted for operation by reception of said standard clock pulses for selecting and determining the most optimal respective one of predetermined measuring and displaying conditions and depending upon the difference between the frequency of said clock signal and the measured watch signal; e) main measuring means for measurement of

time error of said watch signal and depending upon the measuring conditions selected and determined by said preliminary measuring means; and f) time error display means for display of measured results by main measuring means and depending upon the display condition selected and determined by said preliminary measuring means, wherein said first means for sensing a watch signal comprises sensing means for watch signals of a different physical nature comprising periodic stepping information of electrical field, magnetic field and mechanical vibration modes.

3,946,593

MACHINE FOR TESTING BEARING GREASE

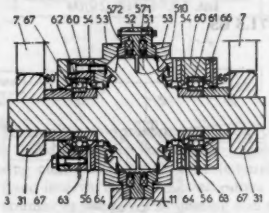
Gabriel Ruget, Saint-Etienne, France, assignor to Creusot-Loire, Paris, France

Filed June 10, 1974, Ser. No. 477,984

Claims priority, application France, June 22, 1973, 73.22900

Int. Cl.² G01N *19/02*

U.S. Cl. 73—10 **14 Claims**



1. A machine for testing greases on bearings, comprising a frame, a shaft, means mounted on said frame for rotating the shaft, two spaced housings containing the grease to be tested, two spaced bearings, each bearing comprising an inner race fixed to the shaft and an outer cage rigidly locked to one of said housings, seals interposed between the shaft and said housings, and means for braking and for heating the bearings including an inner rotor secured to the shaft between the two bearings, a stator locked rotationally with respect to the frame, and a cheek mounted on said stator on each side of the rotor each cheek supporting one of said housings of one.

3,946,594

DISPOSABLE PHASE CHANGE DEVICE

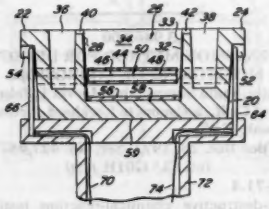
Hubertus Joannes Josephus Surinx, Genk, Belgium, assignor to Electro-Nite Co., Philadelphia, Pa.

Filed Sept. 26, 1974, Ser. No. 509,626

Claims priority, application Luxemburg, Oct. 2, 1973, 68549

Int. Cl.² G01N *25/04*

U.S. Cl. 73—17 R **14 Claims**



1. A disposable phase change device comprising a body of refractory material having a shallow rectangular cavity open on its upper surface, the length of said cavity at its upper end being substantially greater than the depth of the cavity, temperature sensing means associated with said cavity for sensing the rate of cooling of molten metal in said cavity, said temperature sensing means extending transversely across said cavity, said sensing means having first and second end portions, each end portion being supported by a different one of oppositely disposed walls of said body, said body having at least one overflow cavity on its upper surface communicating with said first mentioned cavity, said body having a bottom surface constituting a support surface of the body, and said temperature sensing means terminating in contacts adjacent opposite ends of said body.

3,946,595

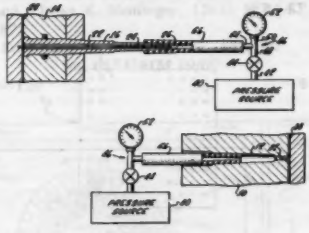
METHOD AND APPARATUS FOR TESTING MOLD VENT ORIFICES

Norris J. Carlson, Santa Ana Heights, Calif., assignor to California Injection Molding Company, Inc., Costa Mesa, Calif.

Filed Dec. 6, 1974, Ser. No. 530,220

Int. Cl.² G01M *3/00*

U.S. Cl. 73—37 **9 Claims**



1. The method of testing size of a venting orifice in a molding machine comprising the steps of

coupling the orifice to a source of pressure,

building up pressure at the orifice above a predetermined value and thereafter isolating the orifice from the pressure source,

causing the built up pressure to decrease by flow through said orifice,

initiating a time interval upon decrease of the built up pressure to said predetermined value, and

terminating said time interval upon decrease of the built up pressure to a second and lower predetermined value, thereby to indicate size of said venting orifice by the length of said time interval.

3,946,596

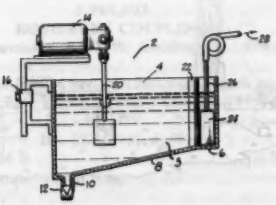
LEAF FILTER TEST AND APPARATUS

Jerome Chung-Hsiung Shiuh, Englewood, Colo., assignor to Johns-Manville Corporation, Denver, Colo.

Filed May 13, 1974, Ser. No. 469,491

Int. Cl.² G01N *15/08*; B01D *37/00*

U.S. Cl. 73—38 **4 Claims**



1. A method for rapidly determining the filtration rate of a fibrous slurry comprising submerging a filter leaf a predeter-

mined distance below the top surface of the slurry for a predetermined time, connecting the filter leaf to a predetermined level of magnitude of partial vacuum during the time the filter leaf is submerged in the slurry, withdrawing the filter leaf from the slurry at the end of said time, removing a layer of solids built up on the filter leaf, drying said layer of solids, and determining the drainage characteristics of the slurry according to the following formula:

$$FR = \frac{DC}{FT \times SA}$$

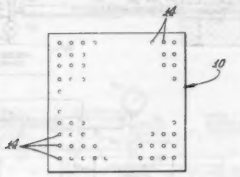
where FR = filtration rate in gm/min/ft², FT = filtration time in minutes, SA = screen area in square feet, and DC = dry cake weight in grams.

3,946,597

FLAW PENETRANT TEST PANEL

John A. Tahbaz, Long Beach, Calif., assignor to Purex Corporation, Lakewood, Calif.

Filed Apr. 26, 1974, Ser. No. 464,348
Int. Cl.² G01N *11/00, 19/08*
U.S. Cl. 73—53 **9 Claims**



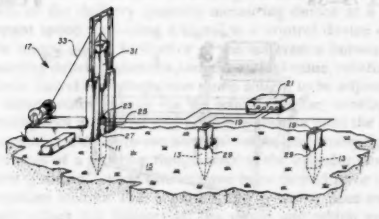
1. A flaw penetrant test panel having a sheet metal surface in which are formed tiny flaw simulating cavities distributed over said surface to receive test penetrant, the mouth size of the cavities being in the range of about 1 to 10 thousandth inch, the cavities being formed by heating the surface layer of the sheet metal to incipient softening and forcing a penetrating tool into the surface layer to a desired depth whereby cavities having crater-like raised rims are formed.

3,946,598

METHOD AND APPARATUS FOR DETERMINING THE DYNAMIC PARAMETERS OF SOIL IN SITU

Robin M. Towne, Portland, Oreg., and Stanley G. Champ, Tacoma, Wash., assignors to Robin M. Towne and Associates, Inc., Seattle, Wash.

Filed July 11, 1974, Ser. No. 487,460
Int. Cl.² G01N *3/30*
U.S. Cl. 73—67.1 **32 Claims**



1. A method of determining the dynamic parameters of soil in situ comprising the steps of:

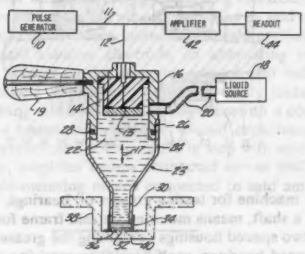
1. determining the transfer function of at least two piles, one of said piles defined as a force pile and the other of said piles defined as a remote pile;
2. embedding said force and remote piles into the soil whose dynamic parameters are to be determined;
3. determining the transfer function of the piles plus the soil by:
   a. determining the driving point transfer function at the force pile; and,
   b. determining the transfer point transfer function at the remote pile; and,
4. selectively subtracting the transfer function of the piles from the driving point transfer function and from the transfer point transfer function to determine the transfer function of the soil.

3,946,599

LIQUID APPLICATOR FOR ULTRA-SONIC TRANSDUCER

Jacob Patt, 22855 Essex Way, Southfield, Mich. 48075

Filed Nov. 8, 1974, Ser. No. 522,187
Int. Cl.² G01N *29/04*
U.S. Cl. 73—71.5 US **5 Claims**



1. In an ultrasonic transducer assembly for locating variations and discontinuities in a test specimen comprising an electro-mechanical transducer head that includes an oscillatable element, passage means for locating a coupling liquid in energy-transmitting relation to the oscillatable element, and liquid source means for replenishing liquid that flows through the passage means: the improvement comprising a number of liquid applicators individually connectable to the passage means to apply the coupling liquid to the test specimen surface; each applicator being detachable from the passage means to permit interchangeable use of differently configured applicators with a single transducer head; each applicator comprising a liquid entrance fitting detachably connectable to the transducer passage means, a liquid exit mouth remote from the entrance fitting, and a conduit interconnecting the entrance fitting and exit mouth; one of said applicators having an exit mouth that has a relatively small transverse area for traversing small specimen surfaces.

3,946,600

ACOUSTIC EMISSION METHOD FOR DETECTION AND MONITORING OF CORROSION

Terry W. Rettig, Santa Susana, and Marvin J. Felsen, Granada Hills, both of Calif., assignors to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Dec. 26, 1973, Ser. No. 427,457
Int. Cl.² G01H *1/00*
U.S. Cl. 73—71.4 **5 Claims**

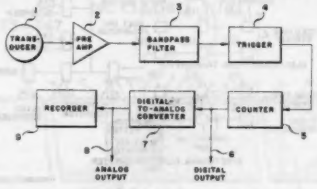
1. A non-destructive chemical-reaction testing method utilizing an electroacoustic sensing and recording device of the type comprising an acoustic transducer for picking up acoustic emissions, a signal processor responsive to the output of the transducer for providing discrete output pulses corre-

sponding to each of the acoustical emissions picked up by the transducer, and a counter for accumulating, and providing an indication of, the discrete pulses from the processor, comprising the steps of:

acoustically coupling said transducer to a first specimen which is subject to and

undergoing a continuous progressing chemical reaction of interest having known chemical process parameters for picking up acoustical emissions therefrom;

making a first fixed-interval recording of the pulses accumulated by said counter in response to said progressing chemical reaction as a function of a single given continuous physical parameter, and thereby establish a standardized acoustic signature corresponding to said first specimen;



acoustically coupling said transducer to a second specimen which is to be tested for the purpose of measuring any progressing chemical reaction extant therein; making a second fixed-interval recording of all pulses accumulated by said counter as a result of subjecting said second specimen to a like degree of said single given continuous physical parameter and for a like interval; and

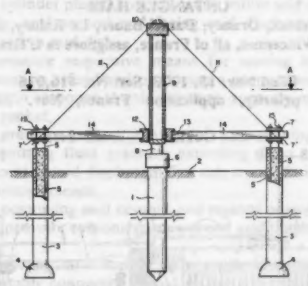
comparing said first and second recordings to obtain a degree of correlation therebetween, the existence of a positive correlation being indicative of the existence of the chemical reaction of interest in said second specimen, and the existence of a negative correlation indicating an absence of said chemical reaction of interest.

3,946,601

METHOD OF LOAD TESTING FOUNDATIONS

David Yizhaki, Haifa, Israel, assignor to Technion Research and Development Foundation, Ltd., Haifa, Israel

Filed June 26, 1974, Ser. No. 483,201
Claims priority, application Israel, July 20, 1973, 42798
Int. Cl.² G01N *33/24*
U.S. Cl. 73—84 **4 Claims**



1. A test rig for load testing of a pile, said rig being adapted for use in conjunction with at least three anchor piles equidistantly spaced from the tested pile, comprising:

a. a vertical center post,

b. a lifting device placed between the top of the test pile and the bottom of the center post,

c. an annular reaction block slidingly and co-centrally arranged on the center post,

d. at least three horizontal, radially-extending compression members, said block being provided on its outer circumference with coupling means for coupling said block to said compression members, each compression member engaging its inner end with one coupling means in said block, and its outer end with the upper portion of one of said anchor piles,

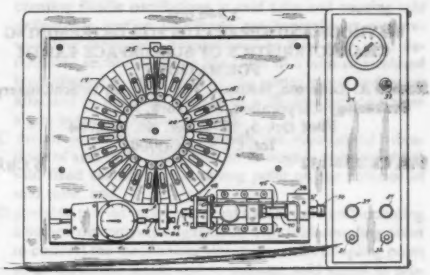
e. at least three tension members each being attached at its upper inner end to a point in the upper portion of the center post and at its outer lower end to a point near the outer end of a corresponding horizontal compression member, and said tension members being dimensioned to become considerably elongated within the elastic limit of their material by the axial forces resulting from said load testing.

3,946,602

PISTON RING TENSION GAGE

Keith D. Huntington, 405 Forest St., Eaton Rapids, Mich. 48827, and Clarke E. Heminger, 12021 S. M-52, Perry, Mich. 48872

Filed June 16, 1975, Ser. No. 587,100
Int. Cl.² G01M *19/00*
U.S. Cl. 73—120 **9 Claims**



9. In a method for automatically gaging the tension of a piston ring assembly, the steps which include:

subjecting the piston ring assembly being tested to a continuous controlled vibratory motion;

compressing the piston ring assembly at a controlled rate to a bore size smaller than the specified bore size;

expanding the piston ring assembly to the specified bore size;

terminating the vibratory motion being imposed upon the piston ring assembly; and

automatically measuring the tension of the piston ring assembly at the specified bore size when said vibratory motion has ceased.

3,946,603

ROTO-FLEX COUPLING

Michael P. Houvouras, 5351 W. Giddings St., Chicago, Ill. 60630

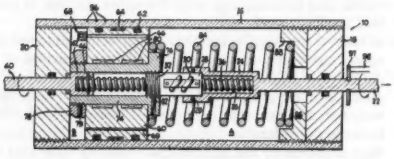
Continuation-in-part of Ser. No. 341,948, March 16, 1973, Pat. No. 3,872,736. This application Oct. 18, 1973, Ser. No. 407,499
Int. Cl.² G01L *3/14*
U.S. Cl. 73—136 B **9 Claims**

1. A torque meter comprising:

a. a housing;

b. an input shaft extending into said housing and an output shaft extending out of said housing, said shafts being journaled in said housing for relative rotation therewith;

c. a threaded interconnection between said shafts for transmitting rotational motion from said input shaft to said output shaft, said interconnection permitting relative rotational and longitudinal motion between said shafts; and

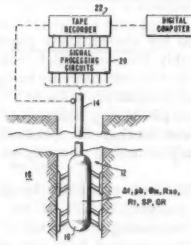


d. non-rotatable biasing means carried within said housing for opposing relative longitudinal motion of said shafts; said biasing means including a piston journaled on one of said shafts to permit relative friction-free rotation thereof; and spring means interposed between said piston and said housing.

3,946,604
METHODS AND APPARATUS FOR DETERMINING CHARACTERISTICS OF SUBSURFACE EARTH FORMATIONS

Donald A. Anderson, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Oct. 5, 1973, Ser. No. 403,764
Int. Cl. E21b *49/00*
U.S. Cl. 73—152 **6 Claims**



1. A machine method of determining characteristics of an earth formation traversed by a borehole, comprising the steps of:

a. providing a plurality of well-logging measurements, indicative of a plurality of properties of the formation at selected depth levels;

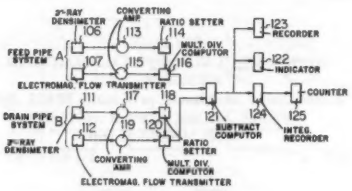
b. combining said measurements to provide a first parameter indicative of the shale content of the formation at selected depth levels; and

c. producing a representation of Poisson's ratio from said first parameter at selected depth levels.

3,946,605
APPARATUS AND METHOD OF MEASURING FLUCTUATIONS OF EXCAVATED MUD AMOUNT IN A SLURRY LINE

Hironobu Yamazaki, Kashiwa; Reizo Kubota, Tokyo; Yoshiaki Uchida, Ichikawa; Taro Kasuya, Urawa, and Norikazu Seki, Chiba, all of Japan, assignors to Tekken Kensetu Co. Ltd., Tokyo, Japan

Filed Nov. 7, 1974, Ser. No. 521,869
Claims priority, application Japan, Nov. 19, 1973, 48-129202; June 4, 1974, 49-63111
Int. Cl.² E21B *45/00*
U.S. Cl. 73—155 **12 Claims**

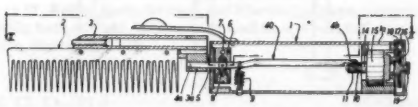


1. An apparatus for measuring fluctuations of solid body amount passed through a fluid path, which comprises feed and drain systems forming said fluid path, means positioned intermediate between respective said feed and drain systems for adding a solid body to said fluid, means provided in each of the feed and drain systems for measuring densities of the fluid passing through each system, means connected to said density measuring means in each of the systems for converting measured density value to a rate with respect to a preliminarily measured specific gravity of the solid body added by said adding means, means provided in each of the feed and drain systems for measuring entire flow amount of the fluid passing through each system, means connected to respective said density value converting means and flow amount measuring means in each system for obtaining from respective outputs of these means an amount only of the solid body in the fluid passing through each system, and means connected to respective said means for obtaining the solid body amount in each system for obtaining any difference between the solid body amounts of the respective systems and thereby calculating fluctuations in the amount of the solid body added to the fluid by the solid body adding means.

3,946,606
DEVICE FOR MEASURING THE FORCE REQUIRED TO UNTANGLE HAIR

Andre Abrioux, Drancy; Daniel Bauer, Le Raincy, and Jules Leroy, Vincennes, all of France, assignors to L'Oreal, Paris, France

Filed Nov. 15, 1973, Ser. No. 416,016
Claims priority, application France, Nov. 20, 1972, 72.41141
Int. Cl.² G01L *5/00*; A45D *24/10*
U.S. Cl. 73—160 **19 Claims**



1. Carding device for measuring the difficulty of untangling a mass of hair, said device comprising a handle adapted to be held in the hand, a carding member capable of movement from an original position through an arc of limited amplitude

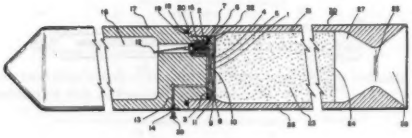
with respect to the handle when a carding force is exerted on said carding member, spring means for resisting movement of said carding member through said arc and for returning said carding member to said original position when said force is relieved, and a resettable counter responsive to relative movement between the carding member and the handle for registering the sum of the amplitudes of a succession of said relative movements.

3,946,607

APPARATUS FOR MEASURING CHAMBER PRESSURE

Edward A. Panella, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 25, 1975, Ser. No. 599,292
Int. Cl.² G01L 5/14
U.S. Cl. 73—167 5 Claims



1. Apparatus for measuring combustion chamber pressure in an end burning grain solid propellant rocket, comprising in combination:

a disk having first and second sides, thickness, a circumferential edge, screw threads on said circumferential edge, and a concentric right circular cylindrical cavity in said first side smaller in diameter than said disk and penetrating said disk a distance less than said thickness, forming a thin circular diaphragm in the central area of said disk and leaving a thick ring at the periphery, securely mounted in said rocket and said second side held in contact with the inhibitive coating on said propellant grain by said screw threads engaging matching screw threads in said rocket,

a cylinder having a diameter and length matching said diameter and depth of said cylindrical cavity, first and second ends, at least one hole penetrating said cylinder through both said ends, at least one surface groove on said first end intersecting said hole, and a compound surface contour on said second end described by a centrally located concave depression blending at a preselected radial distance to a convex toroidal surface and further blending to a plane surface near the periphery of said second end, said cylinder placed concentrically within said cylindrical cavity, said second end facing said diaphragm, fixedly secured to said disk,

fluid pressure responsive means for sensing hydrostatic pressure in a fluid and producing a proportional electric signal in response to said pressure, securely mounted in said rocket,

a fluid pressure transmitting conduit for confining fluid and transmitting fluid pressure extending from the region adjacent to said diaphragm first side to said fluid pressure responsive means,

a fluid occupying said conduit and regions adjacent to said fluid pressure responsive means and said diaphragm first side,

telemetry apparatus having radio transmission means, demountably connected to said rocket and communicating electrically with said pressure responsive means,

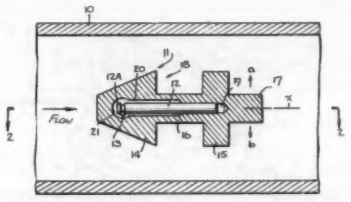
for transmitting combustion chamber pressure in the form of fluid pressure to pressure responsive means for conversion to an electric signal for further transmission to a remote suitably calibrated device for display in units of combustion chamber pressure.

3,946,608

VORTEX FLOWMETER WITH EXTERNAL SENSOR

Peter J. Herzl, Morrisville, Pa., assignor to Fischer & Porter Company, Warminster, Pa.

Filed Feb. 26, 1974, Ser. No. 445,869
Int. Cl.² G01F 1/32
U.S. Cl. 73—194 VS 7 Claims



1. A vortex-type flowmeter installable in a water or other fluid line requiring periodic flow rate testing, said flowmeter comprising:

A a flow tube forming a conduit for the fluid to be metered, said tube being insertable in said line,

B an obstacle assembly mounted in the tube, said assembly having a fixed section mounted across said tube and a deflectable section disposed behind said fixed section, said assembly being capable of generating a vortex street creating fluidic oscillations in said tube and causing said deflectable section to vibrate mechanically at a corresponding frequency proportional to flow rate, said deflectable section being in the form of a non-streamlined body shaped to interfere with the vortex street and being attached to the fixed section by a flexible web to define a gap between the two sections,

C means to mechanically transmit the mechanical vibrations of said deflectable section through a passage within said fixed section to a coupling point on the exterior of said tube, and

D portable test set means external to said tube and including a sensor operatively engageable with said coupling point to convert the mechanical vibrations at the coupling point to an electrical signal and to indicate said signal to provide a flow rate reading, said sensor being removable from said coupling point whereby the same test set means is usable to obtain a reading from any one of a multiplicity of like installed flowmeters.

3,946,609

BAROMETRICALLY COMPENSATED PRESSURE INDEX CONTINUOUS INTEGRATOR FOR MEASURING THROUGHPUT FLUID FLOW OF METERS

Carl J. Kugler, Philadelphia, Pa., assignor to The Singer Company, New York, N.Y.

Filed May 22, 1974, Ser. No. 472,246
Int. Cl.² G01F 1/12
U.S. Cl. 73—233 4 Claims

1. A device for continuously measuring the line absolute pressure of the throughput flow of a meter connected in the line, said device comprising:

a. a housing having a chamber sealed from atmospheric pressure therein,

b. a pressure sensing means mounted in the housing and having one end extending in the chamber freely to move responsive to changes in the line absolute pressure,

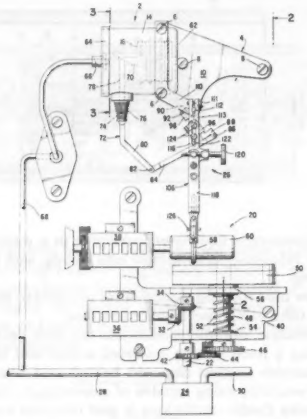
c. a link transfer assembly having one end connected to the free end of the pressure sensing means,

d. a flexible seal means connected to the housing in sealed communication with the chamber,

e. the link transfer assembly extends sealingly outwardly through and partakes of pivotal motion at said seal means,

f. a pressure index continuous integrator associated with the meter and connected to and operated responsive of movements of the outer end of the link transfer assembly, and

g. conduit means connected between the line and the housing to communicate line absolute pressure to one or the other of the chamber or the pressure sensing means, with



the other being evacuated to substantially zero absolute pressure whereby changes in the line absolute pressure will be sensed by the pressure sensing means and transmitted by the link transfer assembly to the integrator to correct the volume of the throughput flow measured by the meter corresponding to changes in the line absolute pressure.

3,946,610

TEMPERATURE MEASURING DEVICE FOR METALLURGICAL FURNACES

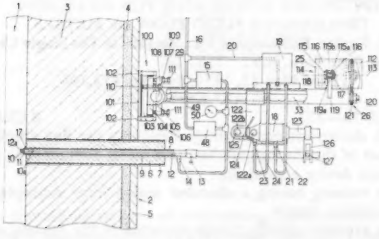
Guy Sartorius, Ban-Saint-Martin, France, assignor to Societe des Aciers Fins de l'Est, Boulogne-Billancourt, France

Continuation-in-part of Ser. No. 369,356, June 12, 1973. This application July 30, 1974, Ser. No. 493,199

Claims priority, application France, Oct. 5, 1973, 73.35725

Int. Cl.[2] G01K *1/14;* **F16H** *57/00*

U.S. Cl. 73—343 R **6 Claims**



1. A device for continuously measuring the temperature of a metallurgical furnace of the type which includes a drive device actuating a measuring rod sliding in a refractory guide tube in the furnace wall, and an attaching device installed on the outside wall of the furnace which supports the drive device and enables it to be oriented parallel with the refractory guide tube, the improvement wherein the attaching device comprises a first rotary element enabling the drive device to be rotated around a first, vertical pivot fixed in relation to the furnace wall, a second rotary element enabling the drive device to be rotated in relation to a second pivot which is disposed on the first rotary element and is at right angles to the first pivot, and means for immobilizing in rotation the first element in relation to the furnace wall and immobilizing in rotation the second element in relation to the first element.

3,946,611

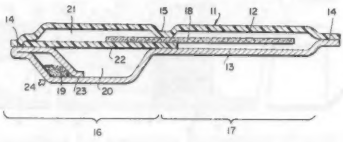
TIME-TEMPERATURE INTEGRATING INDICATOR

Raymond P. Larsson, Denville, N.J., assignor to Bio-Medical Sciences, Inc., Fairfield, N.J.

Filed May 14, 1974, Ser. No. 469,851

Int. Cl.[2] G01K *11/12*

U.S. Cl. 73—356 **15 Claims**



1. A temperature time integrating indicator comprising:

a. a sealed envelope having upper and lower walls, each of a gas impermeable material, the walls being sealed about their periphery, a wick means interposed longitudinally between said walls, said upper wall having a transverse seal at an intermediate position thereof, said seal sealing said upper wall to the wick means and to the lower wall in the area laterally adjacent said wick means thereby defining first and second compartments within the envelope, said compartments being interconnected at the wick means area only, said first compartment being divided into a first and second chamber by a gas permeable film interposed between said upper and lower walls of said envelope;

b. a gas generating material in the first chamber of the first compartment;

c. wick means extending from the second chamber of the first compartment into the second compartment, said wick means being the only means of gas communication across said cross-seal; and

d. an indicator composition deposited on said wick, said indicator composition producing a color change in the presence of the gas generated by said gas generating material.

3,946,612

TEMPERATURE INDICATING COMPOSITIONS

Zsigmond Sagi, Parsippany, N.J., and Berel Weinstein, New York, N.Y., assignors to Bio-Medical Sciences, Inc., Fairfield, N.J.

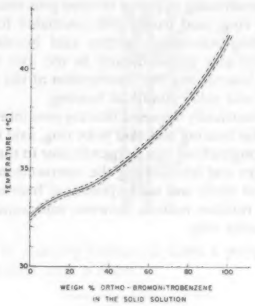
Continuation of Ser. No. 120,998, March 4, 1971, abandoned, which is a continuation-in-part of Ser. No. 58,001, July 24, 1970, Pat. No. 3,665,770. This application Sept. 17, 1973, Ser. No. 398,011

Int. Cl. G01k *11/08*

U.S. Cl. 73—356 **12 Claims**

1. A temperature indicating device comprising a heat conducting carrier having a plurality of spaced regions defined therein, a like plurality of solid solutions of at least two organic compounds in varied composition ratios deposited in said regions, a single composition of said solid solutions being deposited in a single one of said regions, said solid solutions having an essentially linear melting point-to-composition rela-

tionship over the composition ratio range represented by said plurality of solid solutions, and indicator means associated



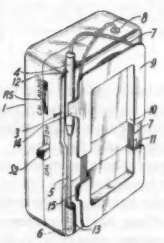
with said deposited solid solutions and operable to indicate the melting of any individual solid solution.

3,946,613

ELECTRONIC THERMOMETER AND PROBE

Seymour Silver, Westbury, N.Y., assignor to LMC Data, Inc., New York, N.Y.

Filed Mar. 7, 1974, Ser. No. 449,041
Int. Cl.² G01K *1/14, 7/24*
U.S. Cl. 73—362 AR **2 Claims**



1. An electronic thermometer comprising:

a. a casing containing a bridge circuit for measuring temperature;

b. a flexible probe of approximately the same length as the longitudinal dimension of said casing;

c. a thermistor mounted in the end of said probe forming one arm of said bridge circuit and being permanently calibrated with said bridge circuit and being permanently connected to said bridge circuit through a lead wire; and

d. means for storing said lead wire and said probe on said casing, said storage means comprising:

i. a protuberance integral with said casing and perpendicular thereto;

ii. a flange integral with said protuberance and perpendicular thereto such that a channel is formed between said flange and said casing such that when said lead wire is wrapped around said protuberance it resides in said channel;

iii. an indentation on a longitudinal edge of said casing, said indentation being of the same general shape as said probe; and

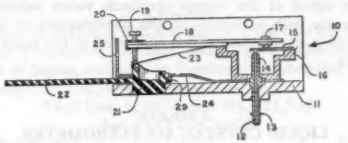
iv. a cylindrical well member at the bottom of said indentation for holding the tip of said probe.

3,946,614

MULTI-POSITION CONDITION SENSING DEVICE

Ronald L. Martin, Mt. Prospect, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 15, 1973, Ser. No. 388,680
Int. Cl. G01k *5/68*
U.S. Cl. 73—363.5 **10 Claims**



1. A condition sensing device adapted for mounting on one of at least two orientations on a support structure, said device comprising:

housing means;

condition sensing means mounted within said housing means for sensing a condition;

set point means for establishing a set point for said condition sensing means, said set point means being mountable in a first position having a first orientation with respect to said housing means and mountable in a second position having a second orientation with respect to said housing means and being adjustable about said first and second positions; and,

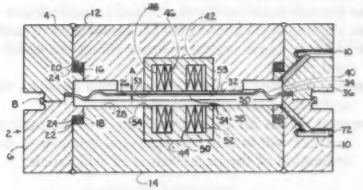
output means responsive to said condition sensing means and set point means, for providing an output dependent upon the sensed condition and the set point.

3,946,615

PRESSURE TRANSDUCER

Stephen Andrew Hluchan, Riverside, Calif., assignor to Bourns, Inc., Riverside, Calif.

Filed June 9, 1975, Ser. No. 585,277
Int. Cl.² G01L *9/10*
U.S. Cl. 73—398 R **14 Claims**



1. A pressure transducer adapted to produce an output signal that is substantially linear with respect to a phenomenon of interest, said phenomenon being a non-linear function of a pressure differential, comprising:

a housing having an interior chamber, and

variable electrical reactance circuitry supported by said housing, said circuitry comprising first and second stationary reactance means disposed in mutually spaced opposition in said chamber, input and output terminals associated with said reactance means, and a flexible diaphragm formed from a magnetically permeable material and anchored within said chamber between said reactance means, said diaphragm being reactively coupled to each of said reactance means and spaced therefrom by first and second gaps respectively, the first of said gaps being in the approximate range of 0.25 to 4.0 mm, the second of said gaps being in the approximate range of 0.05 to 0.8 mm, and the ratio of the first to the second gap being at least 2:1, all of the above dimensions taken with the diaphragm unflexed,

said chamber communicating with the exterior of said housing for reception across said diaphragm of a pressure differential which is representative of the phenomenon of interest,

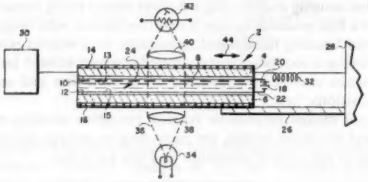
said diaphragm adapted to flex and thereby change its reactive coupling with said first and second reactance means in response to changes in said representative pressure differential, the gap dimensions being selected such that the signal at the output terminals varies substantially linearly with variations in the phenomenon of interest when a steady state signal is applied at the input terminals.

3,946,616

LIQUID CRYSTAL ACCELEROMETER

Freeman B. Jones, Jr., Westlake Village, and Ronald M. Govan, Camarillo, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 9, 1974, Ser. No. 496,429
Int. Cl.[2] G01P 15/00; G02F 1/13
U.S. Cl. 73—516 R **3 Claims**



1. An accelerometer comprising;

a first plate formed of electrically non-conductive material fixedly mounted on an article whose acceleration is to be sensed,

a second plate formed of electrically non-conductive material mounted in spaced relation with said first plate and movable with respect to said first plate and resiliently connected to said article,

an inertial mass fixedly connected to said second plate,

an aligning agent coating the facing surfaces of said plates,

a nematic liquid crystal mixture filling the space between said plates,

means applying an electrical potential between the coated surfaces of said plates, and

optical means for detecting changes in the optical characteristics within said liquid crystal mixture to provide an indication of the acceleration of said article.

3,946,617

MOTION TRANSLATION MECHANISM

Maurice J. Moriarty, Phoenix, Ariz., assignor to US Life Title Company of Arizona, Phoenix, Ariz.

Continuation-in-part of Ser. No. 182,684, Sept. 22, 1971, abandoned. This application Nov. 5, 1973, Ser. No. 413,057
Int. Cl. F16h 23/00
U.S. Cl. 74—60 **5 Claims**

1. In a motion translation mechanism for converting rotary movement to reciprocal movement and for converting reciprocal movement to rotary movement, which mechanism includes

a stationary housing,

a first shaft having a first end and a second end and journaled for rotation intermediate of said ends about the longitudinal axis thereof within said housing, said first end apated for power input or output,

an annular bearing surface integral with the second end of said first shaft, the axis of said bearing surface disposed at an angle to and intersecting the axis of said first shaft,

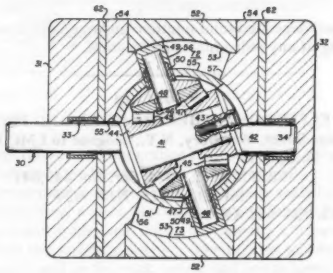
an annular bearing carried upon said bearing surface,

means carried by the second end of said shaft for retaining said annular bearing upon said bearing surface,

a yoke ring disposed about said annular bearing,

a pair of diametrically opposed trunion pins extending from said yoke ring, said truion pins journaled for rotatively reciprocating movement within said housing about a longitudinal axis perpendicular to the axis of said first shaft and intersecting the intersection of the axes of said first shaft and said cylindrical bearing,

a pair of diametrically opposed bearing pins interconnecting said annular bearing and said yoke ring, said bearing pins having a longitudinal axis perpendicular to the axis of said trunion pins and intersecting the intersection of the axes of said first shaft and said cylindrical bearing and journaled for relative motion between said annular bearing and said yoke ring,



a second shaft extending from said yoke ring and having a longitudinal axis coincident with the axis of said trunion pins, the free end of said shaft adapted for power input or output alternate to said first shaft,

improvements therein whereby improved wear characteristics are provided for extended service life of said mechanism and whereby said annular bearing is inherently retained upon said annular bearing surface, said improvements comprising:

a. an annular concave generally V-shaped bearing surface formed integrally with said firat shaft by the intersection of two cones having a coincident axis which is disposed at an angle to and intersects the axis of said first shaft; and

b. an annular bearing having separable halves and an inside diameter shaped to rotationally mate with said annular bearing surfaces.

3,946,618

BULL WHEEL

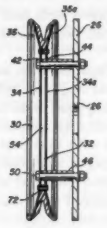
Lane A. Green, Longview, Tex., assignor to Superior Iron Works & Supply Company, Inc., Shreveport, La.

Filed Oct. 9, 1973, Ser. No. 399,082
Int. Cl.[2] F16H 55/36, 55/48
U.S. Cl. 74—230.5 **5 Claims**

1. A segment of a traction wheel adapted for attachment between rims of a drum arranged in a generally V-shaped peripheral configuration, said segment comprising:

a unitary body member having two arms defining a groove therebetween, said arms having a generally U-shaped lip integral therewith at the terminal end of said arms adapted to engage the periphery of such a rim and converging in a generally V-shape having a flange depending from the area of convergence of the arms; and

means adapted to detachably secure said body between such a rim whereby a plurality of said segments can be



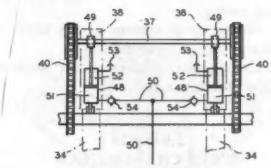
joined in abutting fashion to form a peripheral traction wheel about such a drum.

3,946,619

SCRAPER ELEVATOR POWER CHAIN TENSIONING DEVICE

Stanton D. Needles, and Allan R. Swanson, both of St. Joseph, Mich., assignors to Clark Equipment Company, Buchanan, Mich.

Filed Dec. 9, 1974, Ser. No. 530,648
Int. Cl.² F16H 7/12, 7/10
U.S. Cl. 74—242.1 FP **4 Claims**



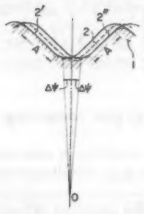
1. In a tractor scraper comprising a self-propelled tractor towing a scraper bowl comprising spaced side walls, an end gate extending across the bowl at the rear and movable between the side walls for expelling dirt material, a floor having an opening at the front portion thereof through which the dirt material is discharged, a rolling door closing the opening when loading earth material in the bowl and movable rearwardly beneath the floor when the end gate is ejecting the earth material through the opening, a fixed blade at the front of the bowl, means for lowering the bowl bringing the blade into engagement with the ground for digging, a scraper-type elevator mounted at the front of the bowl having its lower end adjacent the blade comprising a pair of endless chains, one on each side, a pair of elevator side frames pivotally attaching the elevator to the side walls of the bowl, a head shaft rotatably mounted at the upper ends of the side frames, a foot shaft rotatably mounted at the lower ends, drive sprockets at opposite ends of one of said shafts and idler wheels on the other, said chains being driven by the drive sprockets over the idler wheels and a plurality of spaced scraper-type elevator flights carried downwardly on the upper chain lengths, around the foot shaft and upwardly on the lower chain lengths contacting the earth material adjacent the blade and heaping it in the bowl during the loading cycle, the improvement wherein a power chain tensioning device is built into the elevator side frames and comprises a slidable section movable longitudinally relative to a stationary section, a pair of cylinders, one within each side frame, acting between the stationary and slidable sections thereof for adjusting the length of the elevator frame and therefore the space between the foot and head shafts, a steady state, relatively low, on board vehicle source available during periods of elevator idleness, fluid lines connecting the pressure source to each hydraulic cylinder causing the slidable sections to adjust according to an equilibrium pressure in each cylinder against the established chain tension when the elevator is stopped and check valve means between each cylinder and the source of pressure preventing escape of fluid from the cylinders for maintaining the tension during the elevator loading cycles.

3,946,620

GEAR WITH A TROCHOIDAL CURVED DISK

Kiichiro Yamamoto, Kawagoe, and Shigeru Toyosumi, Obu, both of Japan, assignors to Sumitomo Shipbuilding & Machinery Co., Ltd., Tokyo, Japan

Filed Nov. 6, 1974, Ser. No. 521,545
Int. Cl.² F16H 55/08
U.S. Cl. 74—462 **2 Claims**



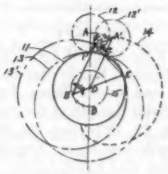
1. A gear with a trochoidal curved disk having a tooth profile, said tooth profile having a first portion, rotatably shifted from the theoretical trochoidal tooth profile about the center of the gear by a phase angle of $+\Delta\phi$ and a second portion rotatably shifted from the theoretical trochoidal tooth profile about the center of the gear by a phase angle $-\Delta\phi$, whereby backlash is provided.

3,946,621

INTERNAL GEARING

William S. Rouverol, 1331 Arch St., Berkeley, Calif. 94708

Filed Jan. 15, 1975, Ser. No. 541,148
Int. Cl.² F16H 55/06
U.S. Cl. 74—462 **14 Claims**

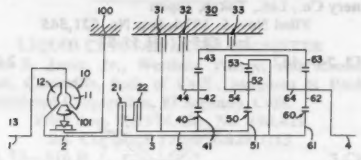


1. In a pair of mating internal gears,
a pinion and an annular gear,
teeth formed on said gears to have, in planes perpendicular to the common pitch element of said pair, a path of contact including a curved portion lying between the pitch circles of said pair and being closer to one pitch circle than the other,
the radius of curvature at profile points on the working portion of the teeth of said annular gear varying with the distance of said points from the pitch circle of said annular gear,
the segment of said path of contact lying on one side of the pitch point of said pair containing, for all rotational positions of said pair, a plurality of contact points at all of which the opposed profile curves are convex.

3,946,622
SPEED CHANGE GEAR

Noboru Murakami, Nagoya; Koichiro Hirosawa, Kariya; Kazuo Ohara, and Koichi Matsuo, both of Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Feb. 7, 1974, Ser. No. 440,545
Claims priority, application Japan, Feb. 26, 1973, 48-22832; Apr. 28, 1973, 48-48901
Int. Cl.² F16H *57/10*
U.S. Cl. 74—765 **1 Claim**

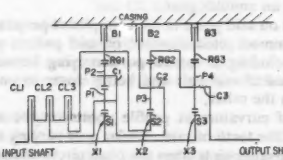


1. A speed change gear comprising:
an input shaft;
a first clutch for coupling or uncoupling a second ring gear and a third sun gear simultaneously to or from said input shaft;
a second clutch for coupling or uncoupling a first sun gear and a second sun gear simultaneously to or from said input shaft;
a first planetary gear engaged with said first sun gear;
a first ring gear engaged with said first planetary gear;
a first carrier rotatably supporting said first planetary gear;
a second planetary gear engaged with said second sun gear;
a second carrier rotatably supporting said second planetary gear;
a third planetary gear engaged with said third sun gear;
a third ring gear engaged with said third planetary gear and coupled to said first ring gear;
a third carrier rotatably supporting said third planetary gear and coupled to said second carrier and to an output shaft;
a second brake capable of being actuated for locking said first carrier to a casing; and
a third brake capable of being actuated for locking said first ring gear and said third ring gear simultaneously to said casing.

3,946,623
SPEED CHANGE GEAR SYSTEM

Noboru Murakami, Nagoya; Koichi Matsuo, Toyota; Koichiro Hirosawa, Kariya, and Kazuo Ohara, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Aug. 29, 1974, Ser. No. 501,686
Claims priority, application Japan, Aug. 29, 1973, 48-97515
Int. Cl.² F16H *57/10*
U.S. Cl. 74—765 **3 Claims**



1. A speed change gear system comprising:
an input shaft;
a first sun gear;
a first planetary gear engaged with said first sun gear;
a second planetary gear engaged with said first planetary gear;
a first ring gear engaged with said second planetary gear;
a first carrier rotatably supporting said first and second planetary gears;
a second sun gear engaged with said first ring gear;
a third planetary gear engaged with said second sun gear;
a second ring gear engaged with said third planetary gear;
a second carrier rotatably supporting said third planetary gear and engaged with said first carrier;
a third sun gear engaged with said first sun gear;
a fourth planetary gear engaged with said third sun gear;
a third ring gear engaged with said fourth planetary gear;
a third carrier rotatably supporting said fourth planetary gear and engaged with said second ring gear;
an output shaft engaged with said third carrier;
a first clutch being capable of coupling or uncoupling simultaneously said first and third sun gears to or from said input shaft;
a second clutch being capable of coupling or uncoupling simultaneously said first and second carriers to or from said input shaft;
a third clutch being capable of coupling or uncoupling simultaneously said first ring gear and said second sun gear to or from said input shaft;
a first brake being capable of locking simultaneously said first ring gear and said second sun gear to a gear casing;
a second brake being capable of locking simultaneously said first and second carriers to said gear casing; and
a third brake being capable of locking said third ring gear to said gear casing.

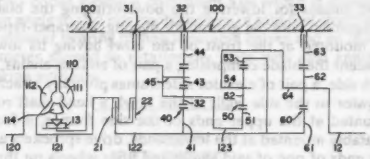
2. A speed change gear system as set forth in claim 1 wherein said first brake is removed.

3. A speed change gear system as set forth in claim 1 wherein said first clutch is removed.

3,946,624
SPEED CHANGE GEAR

Noboru Murakami, Nagoya; Koichiro Hirosawa, Kariya; Kazuo Ohara, and Koichi Matsuo, both of Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Feb. 7, 1974, Ser. No. 440,544
Claims priority, application Japan, Feb. 26, 1973, 48-22830; May 22, 1973, 48-57372
Int. Cl.² F16H *57/10, 3/44*
U.S. Cl. 74—769 **1 Claim**



1. A speed change gear comprising;
first, second and third planetary gear sets suitably interposed between an input shaft and an output shaft;
said first planetary gear set including a first sun gear, a first planetary gear engaged with said first sun gear, a second planetary gear engaged with said first planetary gear, a first ring gear engaged with said second planetary gear, and a first carrier rotatably supporting said first and second planetary gears;
said second planetary gear set includes a second sun gear drivingly coupled to said first carrier, a third planetary gear engaged with said second sun gear, a second ring

gear enmeshed with said third planetary gear, and a second carrier rotatably supporting said third planetary gear;

said third planetary gear set includes a third sun gear drivingly coupled to said first sun gear and to said second ring gear, a fourth planetary gear interengaged with said third sun gear, a third ring gear engaged with said fourth planetary gear, and a third carrier rotatably supporting said fourth planetary gear and drivingly coupled to said second carrier and to said output shaft;

a first clutch for coupling or uncoupling said input shaft to or from said first sun gear, said second ring gear and said third sun gear;

a second clutch for coupling or uncoupling said input shaft to or from said first carrier and said second sun gear;

a second brake means capable of being actuated for locking said first ring gear to said casing; and

a third brake means capable of being actuated for locking said third ring gear to said casing.

3,946,625

LIQUID DETECTOR

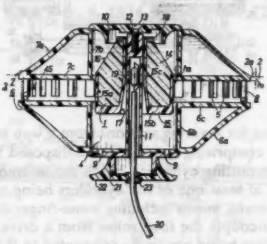
Ken Miyazaki; Narumi Kubota; Kooichi Igarashi; Hiroshi Sato; Kazutoshi Takahashi; Takeshi Maki; Akira Hatano, and Masamitsu Kai, all of Kawasaki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 8, 1974, Ser. No. 468,260

Claims priority, application Japan, May 11, 1973, 48-52170; May 11, 1973, 48-55206[U]; May 11, 1973, 48-55207[U]; July 14, 1973, 48-79493; Nov. 19, 1973, 48-130527

Int. Cl.² G08B *21/00*

U.S. Cl. 73—61.1 R **11 Claims**



1. For detecting the presence, on a first liquid body of a second liquid body in a predetermined amount, said second liquid having a specific gravity less than that of the first liquid, a liquid detector comprising:

a. a detecting float normally floating on the first liquid body surface at a predetermined level in the absence of the second liquid,

b. an external float, floating on the first liquid body surface, and surrounding and vertically movable relative to the detecting float, said detecting and external floats being adapted to sink relative to the second liquid body surface upon contact of the second liquid with said external float when the second liquid is present on the first liquid,

c. means on the detecting float extending a first predetermined amount above the first liquid body surface for permitting an ingress into said detecting float of at least said second liquid when the detecting float has sunk more than said first predetermined amount with respect to the second liquid body surface upon contact by said external float with the second liquid,

d. said detecting float being such that contact therewith by said second liquid will change its mass and cause it to sink with respect to said external float,

e. the external float having a liquid port formed thereon at a second predetermined location below the first liquid body surface for permitting controlled introduction of said first and second liquids into contact with said means permitting ingress,

f. said external float therefore prevents said second liquid from entering said port until said second liquid is present on said first liquid in excess of said second predetermined amount which is dependent on the distance said port is located below the first liquid body surface, when said above condition occurs said second liquid will pass through said port into contact with said detecting float via said means permitting ingress,

g. means mounted on said external and said detecting floats for cooperatively producing a signal by detecting a movement of the detecting float in excess of a given distance vertically relative to the external float.

3,946,626

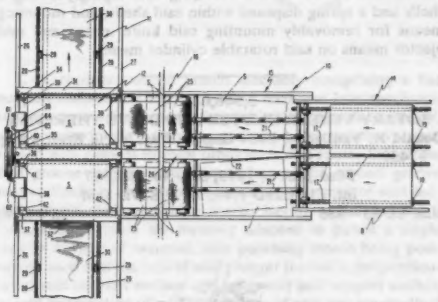
CONVEYOR SYSTEM FOR TRANSFERRING RIGID SHEETS BETWEEN RIGHT ANGLED CONVEYORS

Daniel A. Koppa, Bloomfield, N.J., assignor to Nabisco Inc., East Hanover, N.J.

Filed Mar. 29, 1974, Ser. No. 455,977

Int. Cl.² B26D *7/06*; B65H *29/26*

U.S. Cl. 83—105 **8 Claims**



1. A conveyor system comprising in combination a first conveyor means at one level, a second conveyor means at right angles to the first conveyor means and at a lower level and having an upper flight, and apparatus for transferring rigid sheets from the first conveyor means to the second conveyor means including a pair of spaced stationary guide members aligned with said first conveyor means and positioned above said second conveyor means, said guide member being spaced to receive a sheet therebetween, spaced shafts positioned below said upper flight, sheet supporting arms extending upwardly from said spaced shafts toward each of said guide members, said arms having upper ends normally positioned inwardly of each of said guide members to support a sheet above said second conveyor means, a continuously rotating cam wheel, and cam follower means operated by said cam wheel and connected to said sheet supporting arms for periodically simultaneously pivoting each of said sheet supporting arms outwardly to allow the sheet to drop on the upper flight of the second conveyor means.

3,946,627

ROTARY APPARATUS FOR PUNCHING APERTURES INTO CORRUGATED BOARD MATERIAL

Alfred Hofmann, Nordstrasse 11, 4135 Kapellen Krs. Moers, Germany

Filed Feb. 11, 1974, Ser. No. 441,725

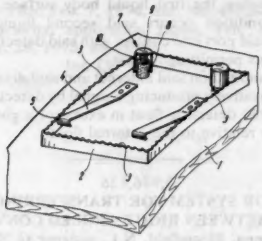
Claims priority, application Germany, Feb. 16, 1973, 7305842[U]

Int. Cl.² B26D *7/18*

U.S. Cl. 83—117 **17 Claims**

1. Rotary apparatus for punching apertures into corrugated board material, comprising rotatable cylinder means having a peripheral surface; board abutment means opposite and

spaced from said peripheral surface; knife means on said cylinder means, said knife means having a cutting edge for cutting out a portion of board material fed between said peripheral surface and said abutment means during rotation of said cylinder means; spring-loaded ejector means for displacing the cut-out portion of the board material relative to the remainder thereof during further rotation of said cylinder means, said ejector means including telescopingly-arranged shells and a spring disposed within said shells; and mounting means for removably mounting said knife means and said ejector means on said rotatable cylinder means.

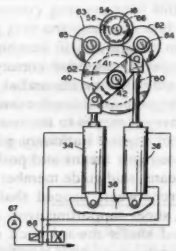


3,946,628

ROTARY VENEER CLIPPER AND DRIVE THEREFOR

Donald H. VanDerlin, 1084 Hagnes Way, North Bend, Oreg. 97459

Filed June 2, 1975, Ser. No. 582,917
Int. Cl.² B26D *1/40*, *5/12*; B27L *5/08*
U.S. Cl. 83—285 15 Claims



13. A rotary clipper comprising:

a rotatable clipper shaft mounting at least one clipper blade,

a rotatable roller anvil parallel to said clipper shaft and spaced therefrom for cutting cooperation with said clipper blade,

fluid-mechanical drive means for rotating said clipper shaft intermittently through a predetermined arc to pass said clipper blade across said roller anvil,

said fluid-mechanical drive means comprising first and second drive cylinder means operable to stroke once simultaneously in response to a clip signal,

first and second independent power-transmitting means each including one-way clutch means drivingly connecting said first and second drive cylinder means to said clipper shaft in a manner such that said first and second power-transmitting means alternate in transmitting power to said shaft upon each successive stroking of said first and second cylinder means,

said first power-transmitting means being operable to rotate said clipper shaft through its said one-way clutch through said predetermined arc in one direction of rotation during simultaneous stroking of said first and second cylinder means in one directional mode,

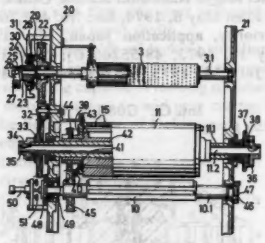
and said second power-transmitting means being operable to rotate said clipper shaft through its said one-way clutch through said predetermined arc in said one direction of rotation during simultaneous stroking of said first and second cylinder means in a directional mode opposite said one directional mode such that said clipper shaft rotates through said predetermined arc in said one direction of rotation upon each simultaneous stroking of said first and second drive cylinder means.

3,946,629

APPARATUS FOR SEVERING SECTIONS FROM A WEB OF MATERIAL

Fritz Achelpohl, Lengerich of Westphalia, Germany, assignor to Windmoller & Holscher, Lengerich of Westphalia, Germany

Filed June 23, 1975, Ser. No. 589,003
Claims priority, application Germany, July 1, 1974, 2431543
Int. Cl.² B26D *1/40*
U.S. Cl. 83—304 4 Claims



1. Apparatus for severing sections from a web advanced by a feed roller, comprising cutting blades disposed transversely to the web on cutting cylinders which are interconnected by helical gears, at least one of the cylinders being mounted for axial displacement, means including a one-finger dog clutch to couple and uncouple the feed roller from a drive means, the cutting cylinders being positively connected to the drive, and further means are provided for axially displacing at least said one of the cutting cylinders to separate the cutting blades when the feed roller is being uncoupled from the drive and for returning the cylinder to bring the blades back into cutting relationship when the feed roller is being coupled to the drive.

3,946,630

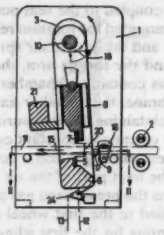
PENDULUM SHEAR FOR CONTINUOUS CASTING INSTALLATION

Adalbert Roehrig, Wadenswil; Josef Zeller, Weesen, and Adrian Stilli, Bulach, all of Switzerland, assignors to Concast AG, Zurich, Switzerland

Filed Oct. 29, 1974, Ser. No. 518,640
Claims priority, application Switzerland, Nov. 2, 1973, 15425/73
Int. Cl.² B22D *11/12*
U.S. Cl. 83—311 8 Claims

1. A pendulum shear for a continuous casting installation, the shear being provided with a mechanical drive for a pulse-like cutting operation, a stand, a pendulum mounted at said stand, a first knife rigidly connected with the pendulum, a driven crank for moving the first knife towards a second knife, mechanism for the acceleration of the pendulum out of its rest position at approximately the maximum knife opening in the direction of travel of the strand, said mechanism including means for accelerating, prior to the start of the cutting operation, the pendulum in its cutting range to a predetermined

speed approximately corresponding to the speed of travel of the strand, the improvement comprising said means for the acceleration of the pendulum comprising an adjustable guide arranged at the stand, said adjustable guide being structured



to guide the pendulum along its path between the rest position and the start of the cutting operation, and wherein the adjustable guide is positioned to slidably cooperate with the pendulum moved by the crank to control such acceleration.

3,946,631

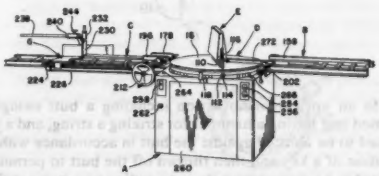
UNDERCUT SAW

John A. Malm, 19731 Frazier Drive, Rocky River, Ohio 44116

Filed Mar. 4, 1974, Ser. No. 447,726

Int. Cl.² B26D *5/04*

U.S. Cl. 83—380 **11 Claims**



1. An undercut saw including a rotatable work support table having an elongated slot therein, a rotatable saw blade operatively mounted beneath said table selectively to be raised and lowered through said slot, a saw blade guard and workpiece clamp spanning said slot above said table, said guard and clamp being movable toward and away from said table, respective fluid power means for said guard and clamp and said saw blade sequentially operative to move said guard and clamp downwardly into engagement with a workpiece on said table and then to move said saw upwardly through said slot, two laterally spaced control devices, one at each side of said table, adapted when simultaneously manually actuated to operate said respective fluid power means, means sequentially operative to lower said saw and then to raise said clamp when the workpiece is cut or when the control devices are prematurely deactuated prior to finishing the cut, a pivotal stop plate carried by said rotatable table, said stop plate nomally being positioned to engage selectively circumferentially spaced fixed abutment blocks to provide index stops for said rotatable table, and an actuator carried by said table operative when depressed to pivot the stop plate to a position permitting the table to be rotated past an abutment block without engagement.

3,946,632

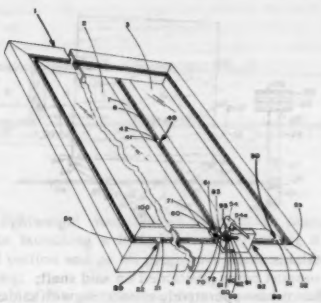
REGISTER CONTROL PUNCH

Ralph E. Crabtree, 844 W. Springfield, Champaign, Ill. 61820

Filed June 13, 1974, Ser. No. 479,034

Int. Cl.² B26D *7/02, 7/16, 5/10*

U.S. Cl. 83—451 **8 Claims**



1. A register control punch assembly comprising a flat support surface said support surface having at least two longitudinally extending grooves formed in the upper face thereof, said longitudinally extending grooves being relatively positioned with respect to each other such that center line of the first groove intersects the center line of the second groove perpendicularly at a point intermediate the ends of said second groove, hole punching means having a plunger and a cooperating female die member adapted to punch a single hole in a sheet of material, said punching means being positioned such that the axis of said plunger thereof is perpendicular to said support surface and intersects said support surface at said intersection of said center lines of said two longitudinal grooves, means for retaining sheet material being punched by said plunger in a position normal to said axis of said plunger, and at least three vertical register hole guide pins, one of said guide pins being positioned within each of the resultant three legs of said two intersecting grooves in said support surface, means associated with each of said guide pins adapting said pins for slideable lateral movement along said grooves and for locking said pins in place at a preselected groove position, the axis of said plunger and the axes of two of said guide pins in said second groove all falling within a plane which is perpendicular to a plane passing through the axis of said plunger and the axis of said guide pin in said first groove, the cross-sectional area of said plunger and said guide pins at the level of said support surface being essentially identical.

3,946,633

APPARATUS AND METHOD FOR MAKING A SHINGLE

Paul A. Campbell, Rte. 2, Box 301 A, Arlington, Wash. 98223

Filed Dec. 7, 1973, Ser. No. 422,733

Int. Cl.² B26D *7/06;* **B27B** *5/02;* **B60G** *11/18;* **B27M** *3/02*

U.S. Cl. 83—705 **27 Claims**

23. An apparatus for making a sawed shingle from a block of wood, said apparatus comprising:

a. a, substantially, horizontal saw for sawing said shingle from said block of wood;

b. a cradle for positioning said block of wood with respect to said saw and for receiving said block of wood;

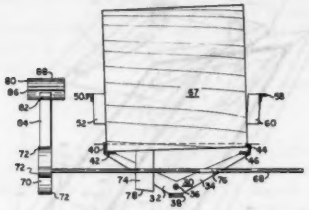
c. a clamping means for clamping said block of wood while said block of wood is on said cradle;

d. a first means for moving said clamping means toward said saw;

e. a block positioning means for positioning said block of wood on said cradle;

f. said block positioning means for positioning said block of wood on said cradle being capable of canting said cradle and said block of wood with respect to said saw;

g. said block positioning means comprising a support for supporting said block of wood with respect to said cradle to position said cradle and said block of wood with respect to said saw;



h. a rotatable shaft;

i. said support being positioned on said shaft;

j. said first means operatively connecting with said clamping means for moving said clamping means with respect to said saw;

k. said first means operatively connecting with said shaft; and,

l. said cradle being positioned near said saw and in operative relationship to said saw.

3,946,634

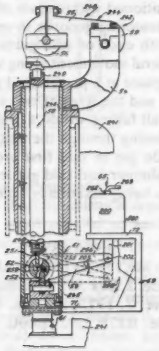
BAND MILL STRAIN MECHANISM

Francis Edwin Allen, North Vancouver, and James Daniel McGuire, Surrey, both of Canada, assignors to Letson and Burpee Ltd., Vancouver, Canada

Division of Ser. No. 240,649, April 3, 1972, Pat. No. 3,810,409. This application Dec. 7, 1973, Ser. No. 422,732

Int. Cl.² B27B *13/08*; B23D *55/10*

U.S. Cl. 83—819 **10 Claims**



1. A bandmill having: a column; a first wheel mounted for rotation on a first arbor; a second wheel mounted for rotation on a second arbor, the wheels being spaced and coplanar and adapted to mount and to drive an endless saw; means to strain the saw supported by the column so that the first arbor can be moved relative to the second arbor, a first portion of the means to strain the saw including:

a. a first wheel support carrying the first arbor, the support being adapted to move relative to the column to strain the saw,

b. a plunger having inner and outer ends, the outer end cooperating with the first wheel support, the plunger being supported in the column and being adapted to move axially relative to the column so as to strain the saw,

c. a knife edge seat assembly including a first knife cooperating with the first wheel support, a second knife cooperating with the plunger, and a seat portion cooperating with the first and second knives,

d. a torque arm coupled to the seat portion, the arm having an inner end mounted for rotation relative to the plunger,

e. an extensible and retractible air spring cooperating with the plunger and the torque arm, the air spring having a pressurized gas containing chamber defined in part by a flexible membrane, the chamber having an inlet port,

f. means for maintaining the pressurized gas contained in said chamber essentially constant comprising a reservoir to contain pressurized gas and a conduit to connect the reservoir to the inlet port of the air spring so that the air spring contains the pressurized gas and force from the air spring is applied to the first wheel support to provide a resilient mounting for the first wheel.

3,946,635

UPRIGHT PIANO ACTION

Masayuki Atsuta, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Dec. 13, 1974, Ser. No. 472,998

Int. Cl.² G10C *3/18*

U.S. Cl. 84—242 **7 Claims**

1. In an upright piano action including a butt swingably mounted and having a hammer for striking a string, and a jack adapted to be abutted against the butt in accordance with the operation of a key and then thrown off the butt to permit the hammer to be moved from its rest position to a string striking position, the improvement of which comprises main spring means adapted to apply to the butt a force for returning the hammer to the rest position during movement of the hammer between a position other than the rest position and the string striking position and to apply no force to the butt when the hammer is moved from said other position to the rest position, and secondary spring means adapted to apply to the butt a force smaller than that of the main spring means and acting in the same direction as the latter.

3,946,636

TOGGLE BOLT

Frederick R. Grey, Belleuve Heights, Australia, assignor to Omark Industries, Inc., Portland, Oreg.

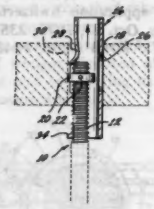
Filed Dec. 2, 1974, Ser. No. 528,791

Int. Cl.² F16B *35/04*

U.S. Cl. 85—3 S **1 Claim**

1. A toggle bolt comprising; a bolt having a head and threaded shank, a toggle member including a sleeve, a nut pivotally mounted within the sleeve and intermediate its ends adapted to received the threaded shank of the bolt, said sleeve having a first slot in one end thereof to permit pivoting of the bolt when engaged with the nut from a first position aligned with the sleeve and a second position crosswise of the sleeve, a leaf spring integrally formed out of a second slot formed in

the sleeve, said leaf spring being on the side of the nut opposite the first slot and projected into the sleeve and into the path of the bolt in said first position, said leaf spring acting against the end of the bolt projected through the nut and into



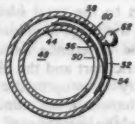
contact with the leaf spring to urge the bolt toward its second position, and said bolt adapted to be screwed out of contact with the leaf spring for free swinging pivotal movement between said first and second positions.

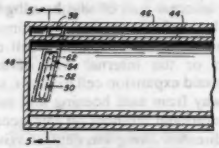
3,946,637

MORTAR WITH VARIABLE VENT FOR ADJUSTING VELOCITY OF A SINGLE CHARGE CARTRIDGE

Carl J. Campagnuolo, Potomac, and Paul A. Curto, Bethesda, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 17, 1973, Ser. No. 407,391
Int. Cl.² F41F *1/06*
U.S. Cl. 89—1 F **4 Claims**





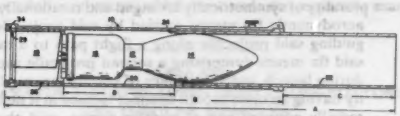
1. A mortar device comprising:
a mortar tube for receiving a cartridge, the tube having an exhaust slot formed therein;
a second tube radially larger that the mortar tube surrounding the mortar tube and creating an annular passageway between the tubes;
arcuate vent valve means positioned in the passageway for sliding displacement over the slot to adjust exposed slot area which communicates with the passageway; and
means connected to the the valve means for moving the valve means to a selected position corresponding to a predetermined exposed slot area;
thereby permitting the exhaust of cartridge gas from the mortar tube to the atmosphere, via the slot and passageway.

3,946,638

LOW RECOIL ANTI-TANK ROCKET LAUNCHER

Bernie J. Cobb, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 29, 1974, Ser. No. 456,408
Int. Cl.² F41F *3/04*; **F42B** *13/32*
U.S. Cl. 89—1.806 **3 Claims**



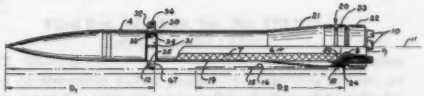
1. A lightweight man-transportable rocket launcher disposed for launching a folded fin rocket having a forward warhead section and an aft propulsive section, said launcher comprising:
a. a pair of launch tube members disposed in telescoping relation, the first of said pair of launch tube members defining the rear launch tube section, the second of said pair of launch tube members defining the front section and having an aft surface terminating in said first section, said second of said pair of launch tube members being disposed for movement between a first non-extended position to a second extended position, said pair of launch tube members disposed for carrying said rocket therein so that said forward warhead section rests in said second section of said pair of tube members in either the extended or non-extended position of said launcher;
b. retention means for retaining the fins of said rocket in folded position in said first of said pair of launch tube members and for release of said fins responsive to entrance thereof into said second of said pair of launch tubes, said retention means being disposed about said fins in secured relation with said rocket and disposed for movement therewith and for abutting engagement with said aft surface of said second tubular member and a shearable restraining means for securing said retention means, whereby responsive to said abutting engagement, said restraining means is sheared and said fins released into said second of said pair of tubular members.

3,946,639

FIN AND SPIN STABILIZED ROCKET

Francis A. Sanvito, and Allen L. Pearson, both of Florissant, Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Sept. 6, 1974, Ser. No. 503,637
Int. Cl.² F41F *3/00*
U.S. Cl. 89—1.808 **21 Claims**



1. A projectile system, which comprises:
launcher means;
a fin and spin stabilized projectile carried by said launcher means, said projectile including:
an elongated cylindrical body having a forward portion and a rearward portion, said rearward portion including a flared, aerodynamic skirt having a larger circumference than said forward portion of said projectile, said skirt including a bearing ring structure forming a part of said skirt, said bearing ring structure defining an

outermost diametric part of said skirt, and including means for permitting free rotation of said projectile along said bearing ring structure, the bearing ring structure portion of said skirt comprising a rearward support for said projectile during launch;

propulsion means carried by said rearward portion for propelling said projectile along a flight path to a target;

means, carried by said projectile for rotating said projectile about its longitudinal axis for spin stabilizing said projectile during flight; and

a plurality of symmetrically arranged and rotationally free aerodynamic fin means carried by said projectile for guiding said projectile along a flight path to a target, said fin means comprising a second projectile support during launch, individual ones of said fin means plurality having an open mouth channel formed in it near the radially outward end of said fin means, said channel having a first width portion and a second, materially different width portion, the smallest of said first and second width portions forming the open mouth part of said channel.

3,946,640

MOBILE ANTI-AIRCRAFT DEVICE

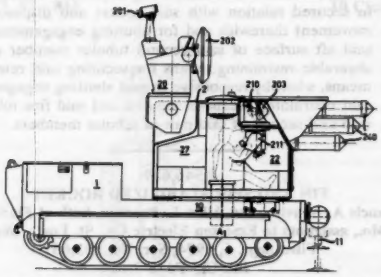
Emil Baumann, Niederglatt, Switzerland, assignor to Contraves AG, Zurich, Switzerland

Filed Nov. 23, 1973, Ser. No. 418,615

Claims priority, application Switzerland, Dec. 4, 1972, 17613/72

Int. Cl.² F41F *3/04*

U.S. Cl. 89—1.815 **5 Claims**



1. A mobile anti-aircraft device comprising a support vehicle having a chassis, a motor driven housing rotatable about a substantially vertical axis with respect to the chassis of the support vehicle, said housing being equipped with a seat for an operating personnel as well as operating-, computing- and control devices and with observation- and target tracking devices as well as weapons, the improvement comprising said housing being provided with substantially flat pivotable side doors, hinge means for mounting said doors to be pivotable outwardly about a substantially vertical axis, and rocket launcher means for a number of rockets serving as weapons externally mounted at said side doors.

3,946,641

DRIVE ARRANGEMENT TO PRODUCE A ROTARY OR TURNING MOTION BY MEANS OF A FLUID OR GASEOUS PRESSURE MEDIUM

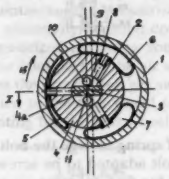
Georg Hirmann, Zurich, Switzerland, assignor to Inventa Ag fur Forschung und Forschung und Patentverwertung Zurich, Zurich, Switzerland

Filed Oct. 30, 1973, Ser. No. 411,025

Claims priority, application Switzerland, Nov. 1, 1972, 15908/72; Germany, Oct. 17, 1973, 2351990

Int. Cl.² F01B *13/06;* F04B *1/06*

U.S. Cl. 91—491 **13 Claims**



1. A drive arrangement for executing a rotary or swivel motion by means of a liquid or gaseous pressure medium, comprising:

a housing;

a working shaft mounted in said housing;

an eccentric part operatively connected to said shaft;

at least one inflatable expansion cell mounted between the internal wall of said housing and said eccentric part along the outer surface of said eccentric part; and being operatively connected thereto; and

input and output means connected at a single location to said cell for feeding and exhausting pressure medium to and from said cell in a predetermined sequence;

wherein said expansion cell is in the form of a freely inflatable cell attached to said input means in a small area with respect to the total surface area of said cell such that during a change in volume of said cell, said cell squeezes and the difference between the circumference of said eccentric part and the interior of said housing is at least partially taken up by the squeezing of said expansion cell and wherein in the minimum volumne phase of the sequence, the periphery of said eccentric part confronts the surface of the internal wall of said housing forming substantially similar surfaces so that a maximum area in a tangential position of said expansion cell contacts said eccentric part or the internal wall of said housing; whereby when said expansion cell expands, said eccentric part moves away from said housing and said expansion cell exerts a rotational moment on said eccentric part, a force that is directed along the central axis thereof and therefore along said working shaft.

3,946,642

HYDRAULIC BRAKE ACTUATING AND LOCKING DEVICE

Thomas M. Bogenschutz, Clayton, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Filed Nov. 21, 1974, Ser. No. 525,787

Int. Cl.² F15B *15/26*

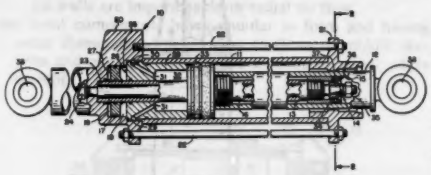
U.S. Cl. 92—24 **1 Claim**

1. A hydraulic brake actuating and locking device for applying brakes of a vehicle comprising an elongated brake cylinder having a tubular push rod axially operable therein for actuating the brakes and a hydraulically controlled locking means for selectively locking axial movement of the push rod relative to the brake cylinder wherein improved locking and control means comprises;

a. a brake cylinder secured between a pressure end flange at one end and a push rod bearing end flange at the other end,

b. an annular locking device disposed within the tubular push rod and operable when rendered effective for acting on a uniform smooth inner periphery of the push rod to restrain the push rod against axial movement relative to the brake cylinder, irrespective of the extent to which the push rod is contained within the brake cylinder, the annular locking device comprising;

1. a fixed locking rod coaxial within the push rod having a plurality of wedges disposed about the periphery thereof at one end and having its other end secured within the pressure end flange,



2. an axially operable tubular locking rod slideable on the fixed locking rod within the push rod and carrying rollers at one end thereof adapted to be wedged between the respective wedges of the first locking rod and the inner periphery of the tubular push rod for use in locking the push rod to the fixed lock rod for preventing retraction of the push rod within the cylinder, and

3. a piston secured on the axially operable locking rod at its other end and disposed in a pressure compartment within the pressure flange whereby the locking of the push rod can be rendered selectively effective or ineffective in accordance with the application of fluid pressure at one side or the other respectively of the locking piston in the pressure chamber.

3,946,643

APPARATUS FOR MANIPULATING SHEET-LIKE BLANKS IN CIGARETTE PACKING MACHINES OR THE LIKE

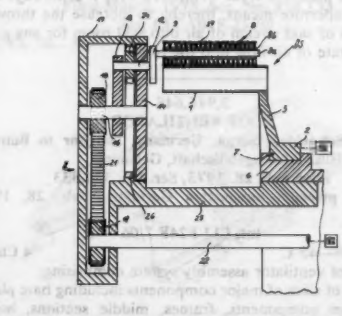
Dieter Schwenke, Hamburg, Germany, assignor to Hauni-Werke Korber & Co. KG, Hamburg, Germany

Filed June 20, 1974, Ser. No. 481,354

Claims priority, application Luxemburg, July 6, 1973, 67958

Int. Cl.² B31B *1/28*

U.S. Cl. 93—12 C **15 Claims**



1. In an apparatus for converting deformable sheet-like blanks into tubular envelopes, particularly for converting blanks into tubular portions of packs for cigarettes or the like, a combination comprising a support indexible about a predetermined axis so that periods of idleness of said support alternate with intervals of angular movement through predetermined distances; a plurality of mandrels fixedly mounted on and indexible with said support so that successive mandrels occupy a draping station during successive periods of idleness of said support; a blank folding member at said draping station; and means for moving said folding member about a mandrel at said station during each of said periods so that said folding member converts a sheet-like blank which is disposed between said folding member and the mandrel at said station into a tubular envelope which surrounds the respective mandrel.

3,946,644

APPARATUS FOR SPREADING OPEN CROSS-BOTTOMS ON TUBULAR MEMBERS

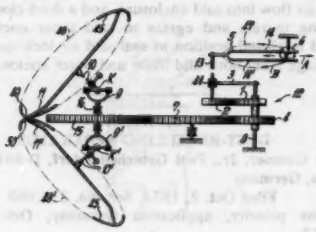
Richard Feldkamper, Lengerich, Germany, assignor to Windmoller & Holscher, Lengerich, Germany

Filed May 8, 1974, Ser. No. 468,167

Claims priority, application Germany, May 10, 1973, 2323727

Int. Cl.² B31B *1/76*

U.S. Cl. 93—28 **6 Claims**



1. Apparatus for spreading cross-bottoms on conveyed tubular members which are to be further processed to form bags or sacks, comprising: two spreader members which rotate synchronously and symmetrically relative to the plane of the tube ends to be formed and which engage into the tube ends for spreading thereof; a non-uniformity drive transmission means driving said spreader members; means for adjusting the degree of non-uniformity of the drive movement produced by the non-uniformity drive transmission means; and means for adjusting the phase position of the nonuniformity of said transmission means.

3,946,645

PROTECTIVE AIR LOCK

Herbert W. Evans, Scarsdale, N.Y., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

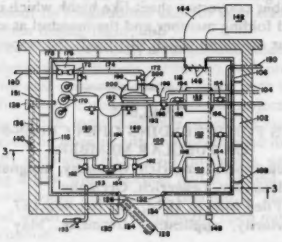
Filed Dec. 14, 1949, Ser. No. 132,921

Int. Cl.² B64D *13/00*

U.S. Cl. 98—1.5 **6 Claims**

1. In combination with a protective ventilating system, an improved building unit affording safety against escape of toxic gases and comprising an outer enclosure, an inner enclosure adapted to house toxic gas processing equipment and spaced from the outer enclosure by a protective air lock space, an air intake extending in sealed relation through said outer enclosure and space into said inner enclosure, single vacuum means connected to said space and to the interior of said inner enclosure, air-removal closure means interposed between said vacuum means and said inner enclosure, said closure means being adapted in closed position to permit an increased air pressure within said inner enclosure and in open position to permit a lowered air pressure therewithin, control means for actuating

said air-removal closure means thereby to apply said vacuum exclusively to said air lock space or simultaneously to said space and to the interior of said inner enclosure, a second closure means disposed in said air intake, a second control means for operating said second closure means, said second



closure means being adapted in closed position to permit isolation of air in said inner enclosure and in open position to permit air flow into said enclosure, and a third closure means providing ingress and egress to said inner enclosure and adapted in closed position to seal said air lock space against air leakage from both said inner and outer enclosures.

3,946,646

DUST-REPELLING APPARATUS

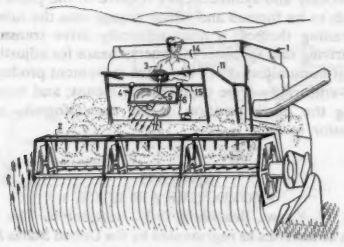
Johann Gassner, Jr., Post Grosshelfendorf, D-8011 Goggenhofen, Germany

Filed Oct. 2, 1974, Ser. No. 511,180

Claims priority, application Germany, Oct. 3, 1973, 2349712

Int. Cl.² B60H *1/00*; B60J *9/04*

U.S. Cl. 98—2 **8 Claims**



1. In a work vehicle having a front end in the direction of travel of the vehicle, a cab area and a seat in the cab area for the driver which faces toward the front end, said vehicle having a dust generating mechanical implement attached at its front end and ahead of the seat, which dust moves toward the driver during vehicular travel, the herein invention comprising: forced air flow generating means mounted on said vehicle between said seat and said front end, said air flow generating means being forwardly directed for directing a forced air discharge in a stream frontwardly of the seat and establishing a principal suction area about the seat, said forced air flow generating means comprises at least one ventilator, and an open frame transversely of the vehicle, said frame constituting mounting means for mounting said ventilator for adjustment on and relative to said vehicle.

3,946,647

DEVICE FOR PREFERABLY COOLING A ROOM BY A VENTILATION AIR STREAM

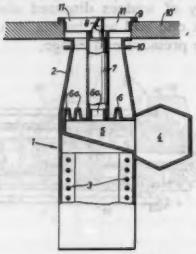
Birger Lärkfeldt, Odensjo-Barnarp, Sweden, assignor to Aktiebolaget Svenska Flaktfabriken, Nacka, Sweden

Filed Apr. 22, 1974, Ser. No. 462,777

Claims priority, application Sweden, May 7, 1973, 7306409

Int. Cl.² F24F *7/06*, *13/06*

U.S. Cl. 98—38 R **7 Claims**



1. In a room air ventilating system comprising air outlet means for delivering a stream of air to a room and air supply means for supplying said stream of air to said air outlet means for passage therethrough into said room, the improvement wherein:

said air outlet means comprises main aperture means positioned substantially at a wall of said room for passing the majority of said stream into said room;

said system further comprises air nozzle means disposed adjacent said aperture means for delivering at least one jet of air into said room along the general direction of said majority of said stream, the cross-sectional area of the orifice of said nozzle means being small compared with the total cross-sectional area of said main aperture means and the outlet of said nozzle means to said room being positioned substantially at or slightly on the room side of said main aperture means; and

said air supply means comprise a common source of air under pressure and first and second means separately connecting said main aperture means and said nozzle means respectively with said common source, said second means providing a smaller pressure drop than said first means such that the linear velocity of said at least one air jet from said nozzle means is large compared with the linear velocity of said air stream through said main aperture means while the volume rate of air flow through said nozzle means is small compared with that through said main aperture means, thereby to increase the throwing length of said stream of air into said room for any given total rate of air flow into the room.

3,946,648

ROOF VENTILATOR

Heinrich Schneider, Sorga, Germany, assignor to Buttner-Schilde-Haas Aktiengesellschaft, Germany

Filed Feb. 28, 1973, Ser. No. 336,833

Claims priority, application Germany, Feb. 28, 1972, 2209301

Int. Cl.² F24F *7/06*

U.S. Cl. 98—43 C **4 Claims**

1. A roof ventilator assembly system comprising:

a series of sizes of major components including base plates, bottom components, frames, middle sections, hoods, impeller wheels, and motors, each component in each size being useable with other components in that size series and at least one component in each size series being useable with components of at least one other size series;

the base plates being annular in shape and forming axial openings therein;

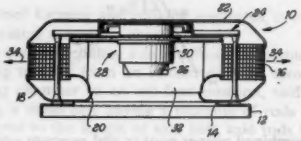
the bottom components being annular in shape and having axial openings therethrough corresponding to and overlying those of the base plates and having outer diameters;

the frames being mountable upon the base plates and bottom components;

the middle sections each comprising a cylindrical wall corresponding in diameter to one of the outer diameters of the bottom components to engage circumferentially an upper edge thereof,

the middle sections comprising a first type wherein said cylindrical walls are permeable to a radial flow of air therethrough and a second type wherein said cylindrical walls are impermeable to radial air flow;

the hood components being annular in form and having outer diameters corresponding to those of middle sections and engaging said middle sections by upper edges thereof,



the hood components comprising a first type wherein said annular form is a non-apertured disc and a second type wherein said annular form defines a central opening of substantial diameter,

said first types of hood components and middle sections being useable together to form a ventilator with radial discharge, and

said second types of hood components and middle sections being useable together to form a ventilator with axial discharge;

the motors being mountable on the frames in spaced axial relation to the bottom components and each carrying on a rotatable shaft thereof a corresponding impeller wheel; and

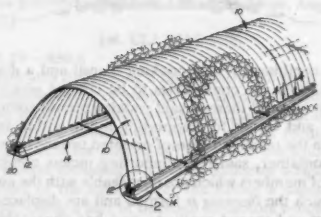
the impeller wheels being rotatable with respect to the base plates and bottom components on said motor shafts and thereupon drawing air through said base plates to exhaust selectively in axial and radial directions.

3,946,649

VENTILATION SYSTEM FOR FOOD STUFFS

Ronald H. Drawsky, Walnut Creek, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed May 2, 1975, Ser. No. 574,133
Int. Cl.² A01F *25/08*
U.S. Cl. 98—56 **7 Claims**



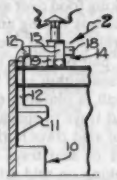
1. In a ventilating system for piled up food stuffs, such as potatoes and the like, the combination of an arched sheet element wherein at least one terminal edge portion of the sheet element is ribbed and a base support for the ribbed terminal edge portion of the sheet element, said base support comprising a base and upstanding and elongated leg sections disposed in spaced relation to each other along their lengths and defining a channel-like opening, the upper portion of at least one leg section also being directed at an outwardly inclined angle to the other leg section, and at least one leg section being provided at an intermediate portion thereof with an inwardly disposed ledge means partially bridging the channel-like opening for receiving and supporting the ribbed terminal edge portion of the sheet element associated therewith so as to permit the circulation of a gaseous medium from the interior and along the length of the arched sheet element to the exterior of said sheet element.

3,946,650

VENTILATION APPARATUS AND METHOD

Clifford Culpepper, Jr., Charlotte, N.C., assignor to Aero-Dyne Manufacturing, Inc., Charlotte, N.C.

Continuation-in-part of Ser. No. 41,995, June 1, 1970, abandoned, and a continuation-in-part of Ser. No. 820,377, April 30, 1969, Pat. No. 3,585,919. This application July 1, 1974, Ser. No. 484,810
Int. Cl.² B01D *45/12*
U.S. Cl. 98—115 K **3 Claims**



2. A method of ventilating a workspace within a building where a process is practiced by which airborne liquid particulate grease is generated, such as a food preparation area where meat is cooked at temperatures of at least about 500°F. on apparatus such as a charbroiler, while collecting grease from the ventilation effluent so as to discharge effluent complying with pollution control regulations, the method comprising the steps of:

exerting suction at a location remote from the workspace and inducing air to flow at conveying velocity from the workspace into an unrestricted hood and through an unrestricted duct to the remote location by drawing flowing air from the workspace to and through a fan located remotely from the workspace,

entraining airborne liquid particulate grease with the flowing air and thereby unrestrictedly conveying entrained grease from the workspace to the remote location, and at the remote location,

directing the flowing air and conveyed grease from the fan into a collection chamber and turning the flowing air and conveyed grease along a circular path defined by a right circular cylindrical inner wall surface of the collection chamber by admitting the flowing air and conveyed grease to the collection chamber tangentially of the inner wall surface and perpendicularly to an axis central to the wall surface, directing the flowing air and conveyed grease in a first direction longitudinally of the central axis and between the inner wall surface and a cone surface converging with the inner wall surface to define therewith a circular throat zone, and then directing the flowing air longitudinally of the central axis through the cone in a direction opposite to the first direction and through a chamber exit which has an area greater than the area of the throat zone while straightening the flow in the direction opposite the first longitudinal direction to direct the

flowing air substantially along longitudinal lines through the chamber exit, and

retaining the separated grease in the collection chamber while passing the flowing air from the chamber exit to the ambient atmosphere.

3,946,651

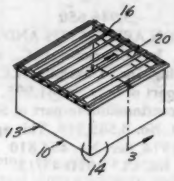
BROILER

Joel H. Garcia, 607 E. Colorado St., Fairfield, Calif. 94533

Filed Jan. 29, 1974, Ser. No. 437,735

Int. Cl.² A47J 36/20, 37/06

U.S. Cl. 99—444 3 Claims



1. A broiler for cooking food over an open flame comprising a generally rectangular box having an open bottom and open top, a food support grill mounted over the open top and supported on said box, a pair of grease trays, means in said box for supporting said trays within said box in vertically spaced relation below said grill, a plurality of elongate openings arranged in each of said trays in spaced parallel relation, with the openings in one of said trays horizontally offset from the openings in the other of said trays to prevent grease from falling from food cooking on said grill directly into the open flame.

3,946,652

DISPENSING SPOON

Sylvan Gorin, 728 Chelten Ave., Philadelphia, Pa. 19126

Filed Aug. 6, 1974, Ser. No. 491,972

Int. Cl.² A47G 19/16

U.S. Cl. 99—323 6 Claims

1. A disposable dispensing spoon for brewing a beverage when the spoon is immersed within a liquid, said spoon comprising an elongated handle having a hollow portion and terminating in a bowl-shaped portion, said bowl-shaped portion including a concave upper wall and a bottom wall spaced slightly therefrom and defining a compartment therebetween and in communication with said hollow portion of said handle, a dry, beverage-making ingredient being disposed within said compartment and said hollow portion of said handle, said bottom wall of the bowl portion having plural apertures therein large enough to permit the free flow of liquid into and out of said compartment when said spoon is immersed in a liquid yet sufficiently small so as to preclude said dry beverage-making ingredient from falling out of said apertures, said upper wall of the bowl being unapertured to enable said brewed beverage to be held within the bowl-shaped portion for sipping therefrom.

3,946,653

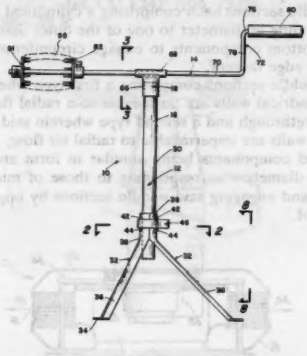
COMBINED WEINER COOKER AND POPCORN POPPER

Mary A. Pugh, Rte. 2, Box 273, Muskogee, Okla. 74401

Filed Sept. 13, 1974, Ser. No. 505,638

Int. Cl.² A47J 37/04

U.S. Cl. 99—340 5 Claims



1. A combined wiener cooker and popcorn popper device comprising an adjustable and collapsible support structure, an independent rod member journalled at one end of said support structure and removably secured thereto, said rod member being rotatable about its own longitudinal axis, wiener cooker means removably secured in the proximity of one end of said rod member and rotatable simultaneously therewith, and popcorn popper cage means selectively engagable with the wiener cooker means and simultaneously rotatable therewith.

3,946,654

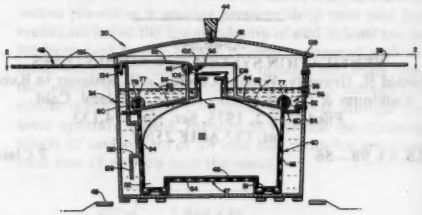
COOKING UTENSILS

Alexander Patton Janssen, 28 Old Farm Road, Bellair, Charlottesville, Va. 22901

Filed Jan. 29, 1973, Ser. No. 327,658

Int. Cl.² A47J 27/10

U.S. Cl. 99—403 27 Claims

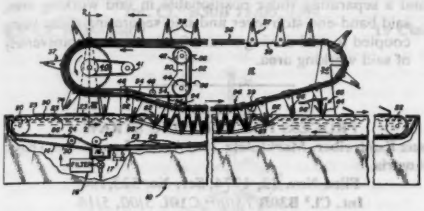


1. The combination of a cooking utensil and a disposable bag for holding the comestibles to be cooked which has an opening in one end thereof, said cooking utensil comprising a container and means for supporting a bag within said container with the open end thereof oriented toward an open end of said container, said bag supporting means comprising a plurality of members which are engageable with the end of the bag in which the opening is formed and are displaceable between first and second positions, said bag engageable members being operable in said one position thereof to gather the bag but to permit gases and vapors to escape from the interior thereof, and said members being operable in said second position thereof to spread the end of the bag and thereby make its interior readily accessible.

3,946,655
TACO SHELL COOKING APPARATUS

Frank R. Schy, 1659 Borden, San Mateo, Calif. 94403

Filed Oct. 15, 1974, Ser. No. 514,795
Int. Cl.² A47J 37/12
U.S. Cl. 99—404 11 Claims



1. Taco shell forming and cooking apparatus, comprising:

means forming a cooking chamber;

conveyor means including a continuous deformable web for carrying tortillas from an in-feed position through said cooking chamber to an out-feed position, said web including a mesh belt having a plurality of rods disposed transverse to the length of said belt, said rods being affixed to said belt at predetermined intervals and extending beyond the edges of the belt on both sides;

forming means including a continuous chain of individual forming members disposed above said chamber, each of said forming members including an elongated wedge-shaped element having its longitudinal dimension directed transverse to the length of said belt, each of said forming members further including indexing fingers disposed proximate the ends thereof and projecting therefrom for engaging certain ones of said rods to drive said belt with said forming members as they pass from said in-feed position to said out-feed position; and

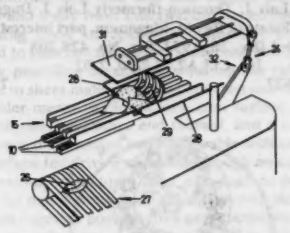
guide means for sequentially guiding each of said forming members into engagement with said belt and for causing a tortilla-carrying portion of said belt to wrap the tortilla about the forming member during the time that the tortilla is carried through said cooking chamber, said guide means including guide rails disposed within said cooking chamber for causing certain other ones of said rods to follow a predetermined path in moving from said in-feed position to said out-feed position to aid in the wrapping of a tortilla-carrying portion about the forming member.

3,946,656
MANUFACTURE OF FILLED PASTRY ROLLS

Harry Wong Hon Hai, Kowloon, Hong Kong, assignor to Winner Food Products Limited, Kowloon, Hong Kong

Filed July 1, 1974, Ser. No. 484,395
Claims priority, application United Kingdom, Aug. 9, 1973, 37758/73
Int. Cl.² A21C 9/06
U.S. Cl. 99—450.6 8 Claims

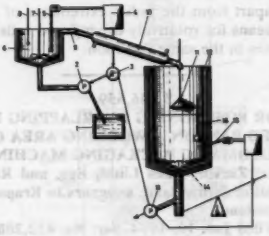
1. Apparatus for making a filled pastry roll from a continuously supplied strip of pastry, the apparatus comprising: a receiving station including a cutter adapted to cut a square of pastry from the leading end of the strip; a feeding station including means for feeding a filling onto the square; a first folding station including a movable deflector adapted to fold one corner of the square over the filling; a second folding station including a pair of opposed deflectors which are movable in succession to fold the two corners adjacent said one corner inwards toward each other so that they overlap; a rolling station including two parallel horizontal platforms positioned one above the other and spaced apart in order to receive the folded pastry between them and means for reciprocating the platforms horizontally relative to one another, whereby the folded pastry is formed into a roll as if it were being rolled between the palms of a person's hands; and means for conveying the pastry from each station to the next.



3,946,657
PROCESS FOR THE CONTINUOUS PREPARATION OF YOGURT AND OTHER FERMENTED MILK PRODUCTS

Fransiscus M. Driessen, Ede; Jacobus J. Stadhouders, Bennekom, and Jacob Ubbels, Ede, all of Netherlands, assignors to Stichting Bedrijven Van Het Nederlands Instituut Voor Zuivelonderzoek, Ede, Netherlands

Division of Ser. No. 349,196, April 9, 1973. This application Aug. 6, 1974, Ser. No. 495,276
Claims priority, application Netherlands, Apr. 7, 1972, 7204690
Int. Cl.² A23C 3/04
U.S. Cl. 99—455 18 Claims

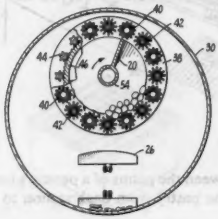


1. An apparatus for the continuous preparation of yoghurt comprising a pre-fermenting tank, means for adding milk to a fermenting mixture of milk and starter in said pre-fermenting tank, a coagulation tank having an inlet end and an outlet end, means for transferring the fermenting mixture from said pre-fermenting tank into said coagulating tank in which further fermentation and coagulation take place, means for cooling the fermenting mixture during passage into said coagulating tank, means positioned at said inlet end of said coagulating tank for distributing the fermenting mixture into said coagulating tank, means for generating shear forces positioned near said outlet end of said coagulating tank, said shear forces generating means including a preforated plate and means for translating said performated plate longitudinally relative to said coagulating tank, and means positioned downstream of said shear forces generating means at the outlet end of said coagulating tank for discharging the resulting product.

3,946,658
PEELING APPARATUS FOR FRUIT AND VEGETABLE ARTICLES

Traver J. Smith, San Jose, Calif., assignor to Genevieve I. Hanscom (formerly Genevieve I. Magnuson), Robert Magnuson, Lois J. Thomson (formerly Lois J. Duggan), as Trustees of Estate of Roy M. Magnuson, part interest to each

Filed Dec. 26, 1973, Ser. No. 428,208
Int. Cl.² A23N *7/00, 7/02*
U.S. Cl. 99—627 **7 Claims**

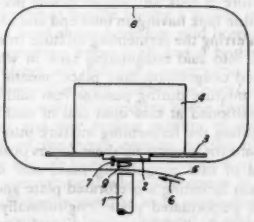


7. Apparatus for peeling fruit and vegetable pieces comprising a plurality of first and second elongate rolls, means for supporting said rolls in parallel uniformly spaced apart relation in a cylindric pattern in which said first rolls alternate with said second rolls around said pattern, said first rolls each having a generally cylindrical core with a plurality of first resilient studs projecting radially outward therefrom and said second rolls each having a generally cylindrical core with a plurality of second resilient studs projecting radially therefrom, the distance between the cores of adjacent rolls being less than the minimum diameter of the pieces to be peeled and said first studs having a length less than said second studs and said second studs having a length greater than one-half the minimum diameter of the pieces to be peeled, said studs having lengths such that the radial extremities of said first studs are spaced apart from the radial extremities of said second studs, and means for rotatively driving said rolls about their respective axes in the same direction.

3,946,659
DEVICE FOR POSITIONING OVERLAPPING ENDS OF A LOOPED BAND IN A WORKING AREA OF AN AUTOMATIC PACKAGING MACHINE

Paul Gutjahr, Zurich; Hans Lüthi, Egg, and René Wasser, Adliswil, all of Switzerland, assignors to Erapa AG, Zumikon, Switzerland

Filed Jan. 10, 1974, Ser. No. 432,288
Claims priority, application Switzerland, Jan. 22, 1973, 853/73
Int. Cl.² G05D *15/00;* **B65B** *13/04*
U.S. Cl. 100—4 **6 Claims**



1. A device for positioning overlapping ends of a band in a working area of a machine comprising:

a first slider moveable on one side of said working area;

a second slider moveable on the other side of said working area;

a driving means coupled to said sliders for moving said sliders towards each other up to a predetermined distance corresponding to the width of said band;

a band-end stop lever positionable in said working area;

and a separating slider positionable in said working area, said band-end stop lever and said separating slider being coupled to said driving means for movement transversely of said working area.

3,946,660
PROCESS FOR UTILISING STRAW

Franz Kuhtreiber, Marktplatz 26a, A2136 Laa an der Thaya, Austria

Filed Nov. 12, 1974, Ser. No. 523,194
Int. Cl.² B30B *13/00;* **C10L** *5/00, 5/16*
U.S. Cl. 100—39 **2 Claims**

1. A process for utilizing straw comprising the steps of

grinding dry straw to produce ground dry straw particles;

wetting the ground dry straw particles with a liquid containing additives for lowering the surface tension, increasing electrical conductivity and improving the cohesion thereof;

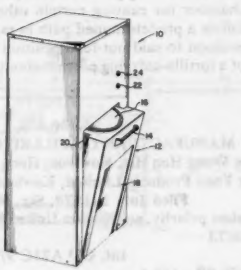
pre-pressing the wetted, ground straw particles to substantially rework the air contained therebetween by pressing the elastic straw particles tightly against one another, whereby the straw particles remain tightly against one another due to the lowered surface tension, the increased electrical conductivity and the improved cohesion; and

final pressing of the substantially air freed straw particles by application of a high pressure to produce bulk density of at least 500 kg/m3.

3,946,661
APPARATUS FOR THE COMPACTION OF REFUSE MATERIAL AND THE LIKE

Milton Clar, Bethesda, Md., assignor to Flinchbaugh Products, Inc., Red Lion, Pa.

Division of Ser. No. 261,325, June 9, 1972, Pat. No. 3,861,296.
This application Jan. 14, 1974, Ser. No. 433,041
Int. Cl.² B30B *15/16*
U.S. Cl. 100—53 **1 Claim**



1. Compaction apparatus comprising a reciprocating compaction blade movable alternately in a compacting direction and a retracting direction, motive means for moving said blade in one of said directions or the other, and control means including a manual actuator for controlling said motive means to move said blade in said compacting direction when said actuator is manually actuated in a predetermined manner, said control means further including means responsive to intital movement of said blade in said compacting direction for controlling said motive means to move said blade in the retracting direction in response to manual actuation of the same actuator in the same manner.

3,946,662
MATERIAL RECEIVING AND COMPACTION SYSTEM AND APPARATUS THEREFOR

Thorvald S. Ross, Jr., Manchester, and Leonard P. Entin, Wayland, both of Mass., assignors to Ross Corporation, Beverly, Mass.

Filed July 23, 1973, Ser. No. 381,742
Int. Cl.[2] B30B *15/06, 1/04*
U.S. Cl. 100—240 19 Claims

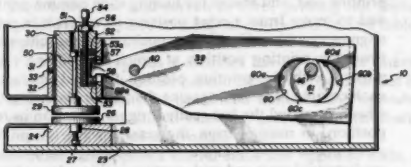
1. A receptacle for material to be compacted having, in combination, a hollow holder, a closure member therefor of essentially rigid material, and a ram:

the holder having an opening at the top; the closure member overlying the opening to close the same, and having a swiveled sealing aperture therethrough; the ram comprising a first portion rotatably, longitudinally and sealingly slidable within the aperture and a second portion for placement upon the material to be compacted, said first portion being swiveled, and rotatably and longitudinally movable relative to the holder; and means on at least one of the holder and the closure member for preventing removal of the latter from the holder unless approximately centered thereon; the ram and the closure member being freely removable from the holder as a unit when the closure member is so centered.

3,946,663
POWER EMBOSSING APPARATUS

Charles Engeriser, 7704 W. Giddings, Chicago, Ill. 60656

Filed Apr. 1, 1974, Ser. No. 456,670
Int. Cl.[2] B44B *5/00*
U.S. Cl. 101—3 R 14 Claims

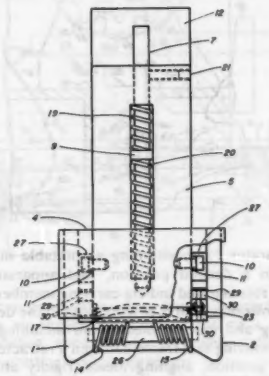


1. An embossing machine comprising in combination: first and second spaced apart die holder means to receive embossing dies for embossing of sheet material place therebetween, support means for supporting said first die holder means in a substantially fixed position, said support means including a base member, parallel spaced apart frame elements secured to said base member and framing a cantilever portion, ram means for movably holding said second die holder means relative to said first die holder means, said ram means being secured to said cantilever portion to carry said second die holder means in a linear motion toward said first die holder means, said cantilever portion including a ram guide, arm means positioned between said spaced apart frame members and pivotally secured thereto intermediate its ends, one end of said arm means being movably coupled to said ram, power drive means coupled to the other end of said ram for selectively moving said ram and said second die holder means toward and away from said first die holder means during an embossing cycle of operation, adjustable coupling means secured to said ram for receiving said one end of said arm and thereby providing means for adjusting the relative pressure exerted to sheet material placed between said first and second die holder means, a closed loop cam surface formed within said arm near said other end thereof, and a cam secured to said power drive means and engageable with said closed loop cam surface for driving said arm through an embossing cycle of operation, said closed loop cam surface providing dwell means for maintaining said first and second die holder means in a close-together position for a predetermined period of time during an embossing operation and for maintaining said die holder means in a spaced apart condition prior to termination of the embossing cycle of operation.

3,946,664
PRINTER TO IDENTIFY WOUND YARN PACKAGES BEING AUTOMATICALLY DOFFED FROM WINDER

Frank Lee Peckinpaugh, Colonial Heights; Duane Rae Prior, Richmond, and Kenneth Roberts Benton, Colonial Heights, all of Va., assignors to Allied Chemical Corporation, Petersburg, Va.

Filed Nov. 27, 1974, Ser. No. 527,918
Int. Cl.[2] B41F *17/10*
U.S. Cl. 101—41 3 Claims



1. A printer to identify wound yarn packages being automatically doffed from a winder comprising in combination

a support block having slidably mounted on the face thereof a stamp, and having mounted on the base thereof a guide block, and said stamp having a cam follower fixably mounted at each side,

a pair of slide plates slidably mounted laterally and opposed on each side of said guide block, and having fixably mounted across the face end thereof of both said slide plates a single front plate,

said slide plates each having a cam slot therein, disposed to engage a respective cam follower on said stamp,

an ink pad swingably mounted adjacant to and spring-loaded toward said stamp,

said stamp having a marking end to be inked by said ink pad, and said stamp having a first spring to bias said stamp to strike a package and a second spring to bias said stamp to retract thereby marking and identifying said package,

each of said slide plates having a further spring tending to urge said front plate away from the face of said guide block into position to be contacted by a package,

said cam slot being cut with an inclined surface to guide a respective cam follower such that said first spring is compressed when said slide plates are moved laterally by a package, thereby cocking said stamp, and a second surface parallel to the direction in which said stamp is biased, whereby as said slide plates reach the end of their travel by reason of contact with a package, said stamp is released to strike said package, and mark it and then retracted by said second spring, and a third surface to allow said stamp to remain at equilibrium and engage said ink pad as said slide returns to rest position when said package is removed.

3,946,665

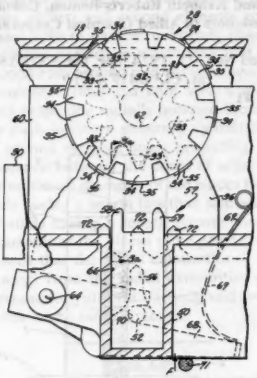
APPARATUS FOR POSITIONING A ROTATABLE INDICIA CARRYING MEMBER

Richard E. Valentine, Mentor, and Norman R. Avery, Chesterland, both of Ohio, assignors to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed June 28, 1974, Ser. No. 484,089

Int. Cl.² B41J *1/32*

U.S. Cl. 101—45 **20 Claims**



1. Apparatus for positioning a rotatable indicia carrying member in a desired position, said apparatus comprising means for rotating said indicia carrying member about an axis to a first position which is at least close to the desired position, an aligning and locking mechanism including a frame and means for moving said frame between a retracted position and a locking position, aligning means rigidly attached to said frame and responsive to movement of said frame toward said locking position to engage and actuate said means for rotating said indicia carrying member so as to position said indicia carrying member in said desired position, and locking means rigidly attached to said frame and operative subsequent to operation of said aligning means when said frame is in said locking position to retentively engage and lock the indicia carrying member against rotational movement.

3,946,666

COMMA PRINTING MECHANISM

Shizuo Yokoyama, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Oct. 21, 1974, Ser. No. 516,664

Claims priority, application Japan, Oct. 25, 1973, 48-123215[U]; May 16, 1974, 49-53831

Int. Cl.² B41J *1/32*

U.S. Cl. 101—99 **4 Claims**

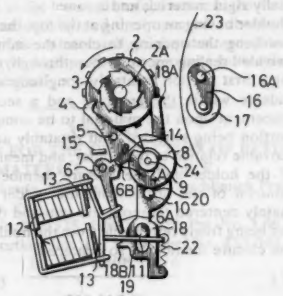
1. A printing apparatus comprising:

a row of rotatable type wheels, each type wheel having a plurality of printing characters around its periphery;

a selector for each type wheel and means for biasing each selector to move from a reset position in which it does not engage its type wheel and interfere with rotation thereof toward an operative position in which it engages its type wheel to prevent rotation thereof and align a selected printing character thereof with a printing position, each selector moveable from the operative to the reset positions against the force of said biasing means;

a trigger claw for each selector and means for biasing each trigger claw to move from an energized position toward a reset position in which it engages its selector, provided the selector is in its reset position, to prevent the selector from moving to its operative position, said trigger claw being movable against the force of its biasing means from the reset position to an energized position in which it does not so engage its selector and allows its selector to move from its reset position to its operative position under the force of its biasing means;

an electromagnet for each trigger claw, each electromagnet being momentarily energizable to momentarily move its trigger claw from the reset to the energized position thereof and to thus disengage the moved trigger claw from the selector engaged thereby to allow the selector to move from its reset to its operative position under the force of the biasing means thereof;



a comma hammer for each of a selected plurality of adjacent type wheels, each comma hammer having a comma printing end, and means for biasing each comma printing end to move from a reset position in which it is out of alignment with said printing position of the characters toward a printing position at which its printing end is aligned with the printing position for said characters, each comma hammer engaging the trigger claw of its type wheel, provided the last recited trigger claw is in its reset position, in moving from the reset toward the printing position and being held thereby at a typing position intermediate said reset and said printing position thereof; and

means for resetting each selector and comma hammer prior to a printing operation, means for momentarily energizing selected electromagnets to momentarily move the trigger claws thereof from the reset to the energized positions thereof and then allow the trigger claws to return to their reset positions after the electromagnets are deenergized, said movement of the trigger claws allowing the selectors thereof to move from their reset to their operative positions and align selected characters of the type wheels thereof with the printing position, means responsive to the movement of a trigger claw from the energized to the reset position thereof to allow the comma hammer thereof to move from its reset toward its typing position,

and means for momentarily energizing selected electromagnets for a second time to again momentarily move their trigger claws from the reset to the energized positions and out of engagement with the comma hammers thereof, to thereby allow the comma hammers thereof to move from the typing to the printing positions under the action of the biasing means of the comma hammers, whereby upon a first momentary energization of selected electromagnets, the trigger claws engaged thereby release the associated selectors from their reset to their operative positions to hereby align selected characters with said printing position, each comma hammer is subsequently released form its reset position upon the return of the associated trigger claw to its reset position and moves to its intermediate, typing position, and each comma hammer moves to its printing position only if the electromagnet of the trigger claw engaging it is momentarily energized a second time.

3,946,667

SCREEN PROCESSING MACHINES

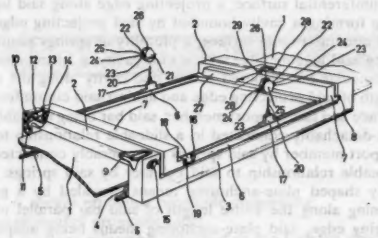
Salvador Gali Mallofre, Londres 29 1°, Barcelona, Spain

Filed Dec. 20, 1973, Ser. No. 426,698

Claims priority, application Spain, Apr. 9, 1973, 413513; Apr. 9, 1973, 413514

Int. Cl.² B41F *15/08, 15/36*

U.S. Cl. 101—123 **7 Claims**



1. In a screen printing machine of the type including a table or platform for positioning thereon of a longitudinally extending piece of material to be printed; a carriage mounted for longitudinal movement along said table; a frame having a flat screen thereon and mounted on said carriage; means for selectively raising and lowering said frame with respect to said carriage to bring said screen out of and into contact with a piece of material positioned on said table; a squeegee or stripper; and means mounting said squeegee or stripper for selective movement over said screen to force printing ink therethrough and onto a piece of material positioned on said table; the improvement wherein:

said carriage comprises a member having opposite lateral sides movably mounted on said table on opposite sides of said piece of material positioned thereon, and opposite ends joining said lateral sides and extending transversely thereto at a spaced above said table;

said frame has opposite lateral sides and opposite ends, a first of said ends being hingedly connected to a first of said opposite ends of said carriage about an axis parallel thereto;

said raising and lowering means comprises coupling means interconnecting a second of said frame ends with a second of said opposite ends of said carriage, said coupling means comprising a rocker shaft rotatably journaled in said second carriage end and extending parallel thereto; at least one driving arm integral with said rocker shaft; at least one lifting arm integral with said rocker shaft; link means for connecting said lifting arm and said second frame end; and reciprocating means connected to said driving arm for reciprocating said driving arm and said rocker shaft about the longitudinal axis of said rocket shaft, and for thereby reciprocating said lifting arm and said link means and thus raising and lowering said second frame end;

said squeegee movement means comprises rails on said opposite lateral sides of said frame; a support mounted on each of said rails; means for moving said supports synchronously along said rails; a lifting device operatively connected to each of said supports for synchronous vertical movement with respect thereto; and a bridge having connected thereto said squeegee or stripper and having opposite ends, one each in gripping engagement with one of said lifting devices; and

means for adjustably regulating the amount of lift of said second frame end with respect to said carriage, said regulating means comprising a cylinder integral with said rocker shaft; said cylinder having an eccentric profile providing two abrupt edges; a fixedly mounted stop positioned to be engaged by a first of said abrupt edges; and an adjustably mounted stop mounted to be engaged by a second of said abrupt edges, the position of said adjustably mounted stop with respect to the circumference of said rocker shaft being variable.

3,946,668

SCREEN PRINTING MACHINES

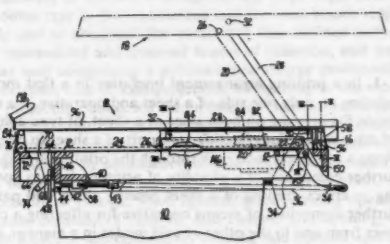
Clifford Douthwaite, Epsom, Ewell; Stuart Pugh, Loughborough, and Ivan Semeneko, Salop, all of England, assignors to USM Corporation, Boston, Mass.

Filed Aug. 9, 1974, Ser. No. 496,298

Claims priority, application United Kingdom, Aug. 15, 1973, 38541/73

Int. Cl.² B41F *15/36*

U.S. Cl. 101—123 **2 Claims**



1. In a screen printing machine having a printing bed, a screen, and a squeeggee for applying ink to a workpiece through the screen, apparatus for moveably supporting the screen on the printing bed comprising:

A. a screen support for mounting the screen in operative relation to the printing bed;

B. a printing bed support for mounting the printing bed in opertive relation to the screen;

C. a first pair of parallel linking elements, one end of each element being pivotally connected to the screen support at opposite sides thereof and the other end of each element being pivotally connected to the printing bed support at opposite sides thereof;

D. a second pair of parallel linking elements extending parallel to the first pair of parallel linking elements and being pivotally connected to the screen support and the printing bed support at pivot points spaced from the points of connection of said first pair of linking elements; and

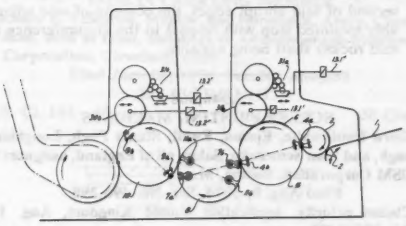
E. coupling means for releasably connecting one end of the second pair of parallel linking elements to the corresponding pivot point to allow alternative unrestricted pivotal motion of the screen support about the pivot axes of the first pair of linking elements.

3,946,669

PRINTING ARRANGEMENT ALTERNATIVELY OPERATED FOR ONE-SIDE PRINTING AND TWO-SIDE PRINTING WITH CONTROL SYSTEM THEREFOR

Albrecht Johne; Karl-Heinz Förster, both of Dresden, and Klaus Schanze, Radebeul, all of Germany, assignors to Veb Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Austrustungen, Leipzig, Germany

Continuation-in-part of Ser. No. 258,078, May 30, 1972, abandoned. This application Nov. 9, 1973, Ser. No. 414,536
The portion of the term of this patent subsequent to June 25, 1991, has been disclaimed.
Int. Cl.² B41F 5/02, 5/16
U.S. Cl. 101—230 15 Claims



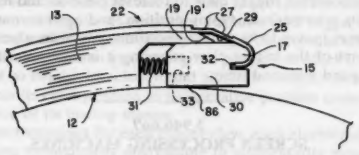
1. In a printing arrangement operative in a first mode for printing on only one side of a sheet and operative in a second mode for printing on both sides of a sheet, of type comprised of drive means for effecting transport of a sheet to be printed along a predetermined path through the printing arrangement, further comprised of a plurality of printing devices cooperating to effect printing of a sheet passing along said path, and further comprised of means operative for effecting a change-over from one to the other of said modes in a manner altering a portion of and changing the length of said path, a control system for the printing arrangement, comprising, in combination, a shift register having a plurality of shift register stages and having a shifting pulse input for receipt of shifting pulses and having an information signal input for receipt of information signals; means for applying to said information signal input a predetermined signal in response to the arrival of a sheet at a predetermined location along said path; shifting pulse generating means synchronized with said drive means and operative for applying to said shifting pulse input a train of synchronizing shifting pulses causing said predetermined signal to be registered by successive ones of said shift register stages in synchronism with the travel of the sheet along said path; a plurality of actuating means each associated with and controlling the operation of a respective one of said printing devices and each connected to a respective one of said shift register stages and each operative for actuating the respective printing device in response to the arrival of said predetermined signal at the respective shift register stage so as to control the operation of the respective printing device in a manner correlated with the arrival of the sheet to be printed at the portion of said path associated with the respective shift register stage; and compensating means operative upon a change of operating mode for at least partially offsetting changes in the correlation between shift register stages of said shift register and the associated portions of said path.

3,946,670

APPARATUS FOR MOUNTING AND LOCKING PRINTING PLATES

Daryl D. Cerny, Greenville, Ohio; Robert W. Cannon, Muncie, Ind.; Robert E. Okeley, II, Yorktown, Ind., and Joseph L. Sannella, Muncie, Ind., assignors to Ball Corporation, Muncie, Ind.

Continuation of Ser. No. 272,604, July 17, 1972, abandoned. This application Oct. 29, 1973, Ser. No. 410,580
Int. Cl.² B41F 27/12, 27/06
U.S. Cl. 101—378 5 Claims



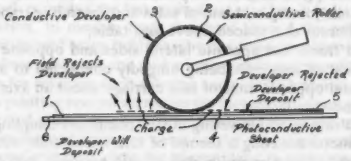
1. A means for securing a printing plate to a cylinder comprising: an arcuately-shaped support member fixedly disposed on said cylinder, said support member having a leading transverse edge and a lagging transverse edge parallel to the longitudinal axis of said cylinder, said cylinder having an outer circumferential surface; a projecting edge along said lagging edge forming a cavity bounded by said projecting edge and said circumferential surface; a plurality of springs positioned along said lagging edge within said cavity; a spring-mounted rectangular bar disposed within said cavity along the entire length of said projecting edge and against said circumferential surface and said support member, said bar being operably and non-detachably connected in a slideable relationship to said support member by said springs and operably connected in a slideable relationship to said cylinder by said springs; arcuately shaped plate-anchoring means provided by a groove running along the entire length of said bar parallel to said lagging edge, said plate-anchoring means being adapted to receive and engage said printing plate in mating relationship whereby a printing plate may be selectively positioned on and attached to said cylinder.

3,946,671

ELECTROSTATIC OFFSET PRINTING

Kenneth Archibald Metcalfe, Lockleys, and Clive Westgarth Wilson, Oaklands Park, both of Australia, assignors to The Commonwealth of Australia, Canberra, Australia

Filed Sept. 26, 1973, Ser. No. 401,107
Claims priority, application Australia, Sept. 28, 1972, 627/72
Int. Cl.² G03G 9/12; B05C 1/16
U.S. Cl. 101—426 6 Claims



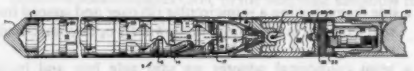
1. A method of effecting offset printing comprising applying a conductive developer to a dielectric surface in the presence of an energizing electrical image-defining field to form a master, fixing the said conductive developer to the dielectric surface whereby to have conductive and relatively insulating areas defining the image, inking the said surface in the pres-

ence of a field of a first polarity to urge the ink to the said surface whereby to retain it at the relatively insulating image areas, and transferring the ink from the said surface to a receiving surface in the presence of a second field of opposite polarity to the first field to urge the ink on to the said receiving surface, and continuing inking the said master and transferring the ink to further receiving sheets, said dielectric surface being formed by coating a base with a photoconductive layer prepared by dissolving a resin in a relatively conductive solvent and suspending the photoconductor therein in a finely divided state and evaporating free solvent, the proportions being selected so that the master has a coating with a dielectric constant greater than 3 less than 10.

3,946,672
ROCKET PROPELLED PROJECTILE

Gary V. Adams; Roy T. Minert, and James R. Thurston, all of Brigham City, Utah, assignors to Thiokol Corporation, Newtown, Pa.

Filed Aug. 13, 1974, Ser. No. 497,020
Int. Cl.² F42B *13/50*
U.S. Cl. 102—49.4 **5 Claims**



1. A rocket-propelled projectile comprising:
an elongated projectile tube;
a nose cone releasably attached to the forward end of the tube;
a plurality of bombs in the tube;
a main parachute in the aft end portion of the tube and attached thereto;
a piston aft of the parachute and attached thereto;
a rocket releasably attached to the aft end of the projectile tube;
an acceleration-initiated fuse in the tube;
a means for producing gas, packaged between the piston and rocket and in communication with the fuse so that it may be ignited thereby to produce expanding gases that bear against the piston and the rocket to separate the projectile from the rocket, the piston becoming also a means for deploying the parachute by creating a drag thereon when the atmosphere engages the freed piston on separation of the projectile from the rocket.

3,946,673
PYROPHORIS PENETRATOR

George A. Hayes, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

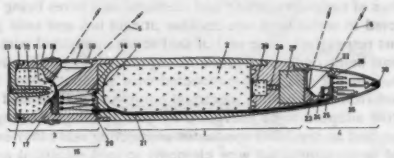
Filed Apr. 5, 1974, Ser. No. 458,149
Int. Cl.² F42B *11/14*
U.S. Cl. 102—52 **2 Claims**

1. A pyrophoric penetrator fabricated from an alloy which contains from 95 to 49 weight percent tungsten, from 50 to 4 weight percent zirconium and from 10 to 1 weight percent of a ductile binder metal selected from the group consisting of nickel, iron, cobalt, and combinations thereof.

3,946,674
CARRYING PART FORMING A PROJECTILE

Henry Gustaf Erland Pettersson; Lars-Erik Skagerlund, and Rolf Lennart Stalfors, all of Karlskoga, Sweden, assignors to AB Bofors, Bofors, Sweden

Filed July 10, 1974, Ser. No. 487,101
Claims priority, application Sweden, Aug. 3, 1973, 7310679
Int. Cl.² F42C *13/02*; H01L *35/00*
U.S. Cl. 102—70.2 P **15 Claims**

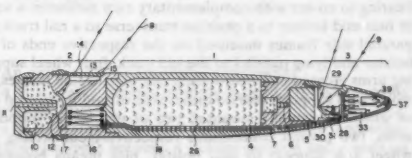


1. In a projectile of the type comprising an elongated casing containing a payload, a proximity fuze, a transmitter unit operative to transmit a beam of radiation toward a target at an angle to the longitudinal axis of said projectile, and a receiver unit responsive to a received beam of radiation reflected from the target and crossing said transmitted beam for controlling said proximity fuze to selectively initiate operation of said payload at a predetermined distance from the target, the improvement wherein said transmitter unit is located adjacent the tail end of said projectile rearward of said payload, and said receiver unit is located adjacent the nose end of said projectile forward of said payload thereby to widely separate the positions on said projectile at which said beams are transmitted by and received by said transmitter and receiver units respectively to achieve a comparatively large angle between the outer rays in the transmitted and received beams respectively and to maximize the measuring base defined between said transmitted and received beams of radiation, said transmitter unit comprising a pyrotechnical charge positioned at the extreme rear of said projectile, an opening in the side of said projectile connected via an interior channel to the space containing said charge, the space for said pyrotechnical charge being connected to said channel via a membrane which can be heated by combustion of said charge, said membrane in a heated condition serving as a source of radiation, said pyrotechnical charge, when ignited, thereby being operative to cause emission of light via said channel and opening, and a lens adjacent said opening for forming said emitted light into said transmitted beam.

3,946,675
POWER-GENERATING DEVICE FOR A PROJECTILE, SHELL, ETC.

Rolf Lennart Stålfors, Karlskoga, Sweden, assignor to AB Bofors, Bofors, Sweden

Filed July 10, 1974, Ser. No. 487,103
Claims priority, application Sweden, Aug. 3, 1973, 73106775
Int. Cl.² F42C *13/02*; H01L *35/00*
U.S. Cl. 102—70.2 G **6 Claims**



1. A projectile comprising a casing defining a space for a payload, said projectile including a source of heat spaced from

said payload and adapted to be activated when said projectile is in its air trajectory, an electrical power-generating device located betweeen said heat source and the payload space, said power-generating device being of the thermocouple type and comprising a plurality of thermo elements which are interconnected to one another at a plurality of hot and cold junctions, said hot junctions being located adjacent said heat source and remote from said payload space, said cold junctions being located adjacent said payload space and remote from said heat source, said thermo elements comprising wires fabricated of alloys of tungsten carbide and rhenium, said wires being connected in series with one another at said hot and cold junctions respectively, one end of said series-connected wire elements being connected to the casing of said projectile and the other end of said series-connected wire elements being insulated from said casing, electrical equipment within said projectile adapted to be energized by said power-generating device, and an insulated conductor connecting said other end of said series-connected wire elements to said electrical equipment.

3,946,676

SELF CENTERING BOGIE

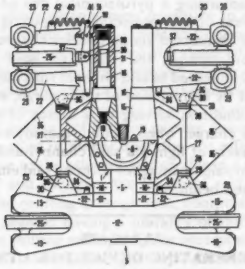
James B. Mackaness, 28 The Crescent, Cheltenham, New South Wales, Australia, and Edward Poitras, 198 Highland St., Holliston, Mass. 01746

Filed July 5, 1973, Ser. No. 376,816

Claims priority, application Australia, July 4, 1972, 9567/72

Int. Cl.² B61F *3/08, 5/04, 5/18, 5/56*

U.S. Cl. 105—169 **13 Claims**



1. A bogie comprising a center bearing, an elongated bolster supporting said center bearing, cam means on said center bearing to co-act with complementary cam means on a wagon to bias said bolster to a position transverse to a rail track; two parallel side frames mounted on the respective ends of said bolster and lying parallel to the rail track, four wheel supporting arms located one below each end of said side frames, two wheel arm supports one on either side of said bolster on each of which is pivotally mounted two of said wheel supporting arms, two pivotal connections respectively connecting each wheel arm support to said bolster, bias means biasing the wheel supporting arms to a position parallel to the rail track, springs exerting a bias force between said side frames and said wheel supporting arms, and a wheel rotatably mounted by stub axles on each wheel supporting arm.

3,946,677

SUSPENSION DEVICES OF SIDE MEMBERS ON AXLE-BOXES FOR RAILWAY CARRIAGES AND SIMILAR APPLICATIONS

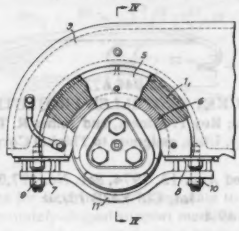
Paul E. Henricot, Ceroux-Mousty, Belgium, assignor to Societe Anonyme Usines Emile Henricot, Court-Saint-Etienne, Belgium

Filed Nov. 5, 1974, Ser. No. 521,077

Claims priority, application Belgium, Jan. 10, 1974, 809588

Int. Cl.² B61F *5/26*

U.S. Cl. 105—224.1 **1 Claim**



1. A suspension device for a railway car, comprising:

a generally cylindrical axle box;

a side frame having a semicircular rib over and spaced from said axle box and having a downwardly open semi circular recess on each side of said rib;

a semi cylindrical adapter on said axle box and having spaced rim portions below said recesses and spaced axially from said rib;

a semi circular rubber bead seated in each recess and resting on said adapter inwardly of said corresponding rim portions to resiliently support said side frame on said axle box;

stop members on said side member adjacent the ends of said recesses and engaging adjacent ends of said rubber beads to retain the same in said recesses; and

a guard member extending under said axle box and being secured to said side member to prevent upward separation of said side member and beads from said axle box.

3,946,678

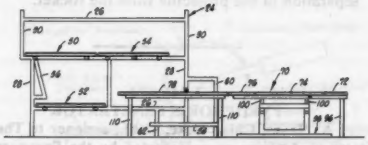
CONVERTIBLE VEHICLE PLATFORM AND SHELF APPARATUS

Jackson P. Birge, II, and David A. Bradshaw, both of Oklahoma City, Okla., assignors to Progressive Engineering Design, Edmond, Okla.

Filed Jan. 30, 1975, Ser. No. 545,595

Int. Cl.² B60P *3/32;* **A47B** *85/04*

U.S. Cl. 108—44 **9 Claims**



1. A convertible platform and shelf apparatus for a van vehicle or the like having interior sides and a floor, comprising:

a frame strut assembly connectable to the interior sides of the vehicle on opposite sides thereof;

a first shelf member detachably connectable to the frame strut assembly and extending transversely to the vehicle, the first shelf member characterized as comprising:

a first planar member;

a second planar member pivotally connected to the first planar member, the first and second planar members selectively positionable in a first mode wherein the planar members are in rigid coplanar relationship and in a second mode wherein the first and second planar members are angularly disposed to each other;

retractable leg means connected to the first planar member for selectively supporting the first planar member;

a second shelf member detachably connectable to the frame strut assembly and extending transversely to the vehicle, the first shelf member characterized as comprising:

a first planar member;

a second planar member pivotally connected to the first planar member, the planar members positionable in a first mode wherein the planar members are in rigid coplanar relationship, the second shelf member selectively connectable to the frame strut assembly at an angle to the horizontal, the first shelf member and the second shelf member selectively cooperating to form a seat;

a base plate connectable to the floor of the vehicle, the base plate having a top surface;

a guide pin connected to the top surface of the base plate generally in the center of the base plate;

a seat base assembly slidably supported by the base plate and characterized as comprising a box frame having a guide pin being receivable and slidably retainably by the guide pin track; and

platform means connectable to the seat base assembly for selectively forming a seat or a platform.

3,946,679

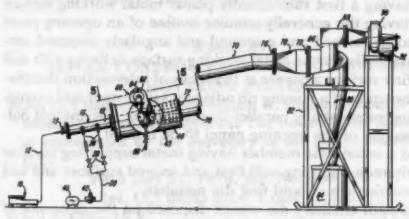
METHOD AND APPARATUS FOR TREATING A CONTINUOUS FLOW OF FLUID WASTE PRODUCTS AND OTHER MATERIALS

Frederick T. Varani, Golden, Colo., assignor to Adrian Const. Co., Dayton, Ohio

Filed Dec. 28, 1973, Ser. No. 429,096

Int. Cl.² B01D *35/18;* **F23B** *1/32;* **F23G** *3/00;* **F26B** *11/12*

U.S. Cl. 110—8 C **10 Claims**



1. A method of drying or burning a continuous flow of organic waste material, comprising the steps of pumping the material through an elongated rigid porous tube, forcing a gas generally radially inwardly through the pores of the tube and into the material flowing through the tube to create substantial turbulence within the material for disintegrating the material into fine particles and to accelerate the flow of particles within the tube, discharging and expanding the accelerated particles from the tube into a heating chamber, directing a flame into the material, and introducing air into the disintegrated material after it is discharged from said tube and prior to directing the flame into the material.

3,946,680

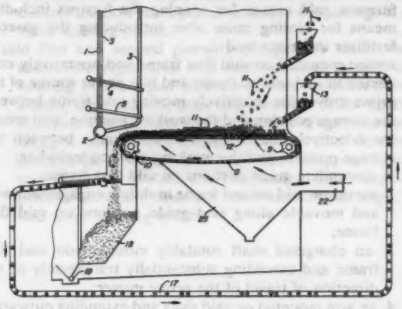
BURNING USED TIRES, ETC. AND APPARATUS THEREFOR

Joseph R. Laman, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Dec. 23, 1974, Ser. No. 535,251

Int. Cl.² F23G *7/00, 5/12*

U.S. Cl. 110—18 C **26 Claims**



1. The method of burning used whole tires which comprises feeding the same above and out of contact with a bed of particles of incombustible matter supported on a grate having openings therethrough, and supplying air through said openings to support the burning of the waste while substantially completely surrounding them with air, and preventing any substantial amount of melt from the burning waste descending onto the grate by intercepting the same by said particles of incombustible matter, the particles being larger than openings in the grate.

14. A combustion shamber with a grate with openings therein, means for spreading a bed of incombustible particulate material over the grate, the particles of the particulate matter being too large to enter the openings, means for conveying whole tires through the chamber above the bed, and means for introducing air into the chamber.

3,946,681

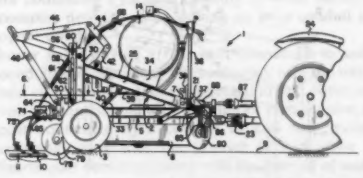
EARTH WORKING APPARATUS

Merton E. Sylvester, Rte. 1, Sabetha, Kans. 66534

Filed Dec. 26, 1974, Ser. No. 536,640

Int. Cl.² A01C *23/02*

U.S. Cl. 111—7 **9 Claims**



1. An earth working apparatus comprising:

a. a first frame having laterally spaced ground engaging wheels;

b. a second frame mounted on said first frame and selectively movable between a storage position and a working position;

c. means mounted on and extending from one of said first frame and said second frame for connecting same to a prime mover;

d. means mounted on said second frame and movable therewith for cutting vegetation extending above a ground surface;

e. means mounted on said first frame for storage of a supply of gaseous fertilizer;

f. means operatively connected to said gaseous fertilizer storage means and mounted on said second frame and movable therewith for opening a plurality of laterally spaced furrows and introducing gaseous fertilizer into the furrows, said means for opening the furrows including means for closing same after introducing the gaseous fertilizer thereinto; and

g. means mounted on said first frame and operatively connected to said second frame and to a power source of the prime mover for selectively moving said frame between the storage position and the working position, said means for selectively moving said second frame between the storage position and the working position including:

1. upstanding guide portions on said first frame;

2. means on said second frame in sliding engagement with and movable along said guide portions on said first frame;

3. an elongated shaft rotatably mounted on said first frame and extending substantially transversely of the direction of travel of the prime mover;

4. an arm mounted on said shaft and extending outwardly therefrom;

5. a link having one end thereof pivotally connected to said arm;

6. a bell crank having a first pivot point connected to said first frame and a second pivot point having an other end of said link pivotally connected thereto, said bell crank having a third pivot point; and

7. a second link having one end thereof pivotally connected to the third pivot point of said bell crank and an other end thereof pivotally connected to said second frame whereby rotation of said shaft and arm in one direction is operative to raise said second frame and rotation of said shaft and arm in an opposite direction is operative to lower said second frame.

3,946,682

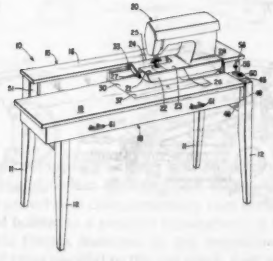
SWINGAWAY CONVERTIBLE BED CABINETS

Roy Melvin Cowdrey, Cranford, and Robert Seymour Peets, Watchung, both of N.J., assignors to The Singer Company - Patent Department, New York, N.Y.

Filed Oct. 25, 1974, Ser. No. 517,981

Int. Cl.² D05B 75/00

U.S. Cl. 112—217.1 **8 Claims**



1. A work table for a sewing machine having sewing instrumentalities including a needle carrying needle bar and a work supporting bed formed with a rear laterally disposed edge, a front laterally disposed edge, a first longitudinal edge adjacent said sewing instrumentalities and a second longitudinal edge joining said laterally disposed edges, said work table comprising: a rear, laterally elongate, work table portion having a rear work supporting surface; means supporting said sewing machine with said rear laterally disposed edge of said work supporting bed contiguous to and forwardly of said rear work table portion, with said first longitudinal edge forwardly of said rear work table portion, and with said work supporting bed co-planar with said rear work supporting surface; and, a front, laterally elongate, work table portion have a front work supporting surface, said front work table portion being located forwardly of and contiguous to said rear work table portion laterally beyond said sewing machine first longitudinal edge to the lateral end of said rear work table portion, said front work supporting surface being space below said work supporting bed of said sewing machine and rear work supporting surface of said rear work table portion.

3,946,683

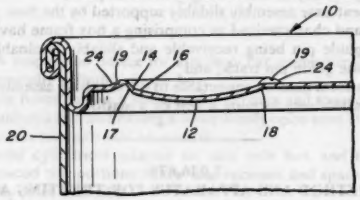
TABLESS CONTAINER OPENING DEVICE AND METHOD AND TOOLS FOR FORMING THE SAME

Charles L. Jordan, Pittsburgh, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 318,476, Dec. 26, 1972, abandoned. This application May 2, 1974, Ser. No. 466,405

Int. Cl.² B21D 51/40

U.S. Cl. 113—15 A **8 Claims**



1. In the formation of a sheet metal container component having at least one substantially rigid inwardly displaceable opening panel comprising a minor portion of the container component and an outwardly projecting deflectable portion disposed in integral interconnected relation therewith by a fracturable web,

the steps of:

introducing a sheet of metal intermediate a first die member having a first substantially planar metal working surface having the generally annular outline of an opening panel to be formed and a second and angularly disposed substantially planar metal working surface defining with said first surface a corner at the locus of intersection therebetween, and a coining rib adjacent said corner and extending substantially parallel thereto on the side thereof outwardly of the opening panel to be formed,

and a second die member having metal supporting surfaces thereon opposing said first and second surfaces and said coining rib on said first die member,

and with auxiliary die means disposed on the same side of the sheet as said first die member having a metal shaping base surface facing in a generally opposite direction from said metal supporting surfaces of said second die member and in laterally spaced relation therewith;

lineally displacing said first die member toward said second die member to selectively move said first and second surfaces of said first die member into operative proximity with said metal supporting surface of said second die member, and thereby engage said sheet to laterally displace portions of said sheet as said corner penetrates the sheet to form said fracturable web,

coining said sheet between said coining rib and said supporting surface along a zone adjacent said fracturable web outwardly of the opening panel within the fracturable web,

lineally displacing said auxiliary die means towards said second die member to selectively move said base surface

thereof into predetermined longitudinally offset relation with said metal supporting surface of said second die member in the direction of die displacement to form said deflectable portion by the conjoint action of said base surface and said metal supporting surface, and

stopping said die member displacement when said corner of said first die member has penetrated the sheet to within a few thousandths of an inch of said metal supporting surface of said second die member.

3,946,684
SEMI-SUBMERSIBLE JACKUP APPARATUS

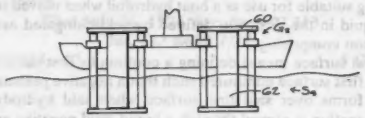
Maurice N. Sumner, 1718 Lubbock St., Houston, Tex. 77007

Division of Ser. No. 107,288, Jan. 18, 1971, Pat. No. 3,716,993, which is a continuation-in-part of Ser. No. 649,889, June 29, 1967, Pat. No. 3,575,005. This application Apr. 12, 1972, Ser. No. 243,184

The portion of the term of this patent subsequent to Feb. 20, 1990, has been disclaimed.

Int. Cl.² B63B *35/00*

U.S. Cl. 114—0.5 D **10 Claims**



1. An offshore marine structure adapted to be stationed afloat at an operational site comprising:

a vessel adapted for navigating in water, at the surface thereof,

a buoyant upright member for positioning within the water and above the marine floor at such time as said structure is stationed offshore,

a means comprising an outrigger lying athwart and outboard of said vessel for vertically translating the elevation of said upright member relative to said vessel for elevating said vessel above the water and supporting said vessel on said buoyant upright member above the water at such time as said structure is stationed offshore, and

a means connecting said vessel to said means for translating the elevation of said upright member.

3,946,685
HOVER CONTROL VALVE FOR SUBMARINE HOVERING SYSTEM

Barry O. Chadbourne, and William H. Stoddard, both of North Stonington, Conn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 11, 1974, Ser. No. 487,527

Int. Cl.² B63G *8/14;* **F16K** *11/085*

U.S. Cl. 114—16 E **17 Claims**

1. A rotary control valve comprising:

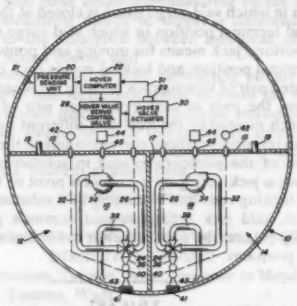
valve housing means with an essentially cylindrical chamber formed around a central axis and having a plurality of openings spaced around the cylindrical periphery thereof:

cylindrical valve means positioned coaxially within said cylindrical chamber and arranged for rotation about said central axis, said cylindrical valve means having a first plurality of aperture means through oppositely disposed portions of the cylindrical wall of said cylindrical valve means, said aperture means being disposed over an appreciable portion of the length of said cylindrical valve means, and a second plurality of aperture means through the cylindrical wall of said cylindrical valve means on both sides of said first plurality of aperture means and adjacent thereto, said second plurality of aperture means extending over an appreciable portion of the length of said cylindrical valve means;

partition means extending lengthwise within said cylindrical valve means so that the oppositely disposed portions of the cylindrical wall wherein said first plurality of aperture means are located are spanned, said partition means being positioned so that the interior of said cylindrical valve means is divided into at least two sections for the purpose of preventing unwanted crossflow between said openings in said valve housing means; and

means for rotating said cylindrical valve means in order to control the flow through said plurality of openings in said valve housing means;

said first and second plurality of aperture means being selectively registrable with said openings in said valve housing means upon rotation of said cylindrical valve means, the numbers, sizes and locations of the aperture means of said first and second plurality of aperture means being so chosen and arranged that the total flow resistance to the flow of fluid through said rotary control valve is substantially constant and independent of the rotational position of said cylindrical valve means with respect to said valve housing means.



10. A submarine hovering system comprising:

tank means adapted to be enclosed within a submarine hull for containing a variable quantity of water ballast;

a constant delivery pump having an inlet conduit and an outlet conduit;

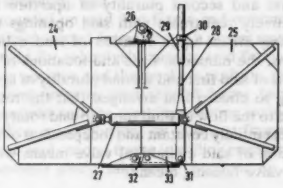
a hover valve having a first port connected to said inlet conduit, said first port communicating with the interior of said valve, a second port connected to said outlet conduit and communicating with the interior of said valve, a third port connected by a conduit to said tank means and communicating with the interior of said valve and a fourth port communicating with the interior of said valve and connected to a conduit adapted to communicate with the water surrounding said submarine hull, said hover valve further comprising a rotatable cylindrical valve element enclosed interiorly of said hover valve, said valve element having a plurality of aperture means in the cylindrical wall thereof for variably and selectively distributing the flow among said ports upon rotation of said valve element, the numbers, sizes and locations of said aperture means being so chosen and arranged so that the total flow resistance of said hover valve remains substantially constant and independent of the variable distribution of water flow among said ports.

3,946,686

BOTTOM-DUMP VESSEL

Bartele van der Werff, Medemblik, Netherlands, assignor to A. Vuyk & Zonen's Scheepswerven B.V., Capelle an der Ijssel, Netherlands

Filed Mar. 28, 1974, Ser. No. 455,733
Claims priority, application Netherlands, Mar. 30, 1973, 7304466
Int. Cl.² B63B *35/30*
U.S. Cl. 114—29 2 Claims



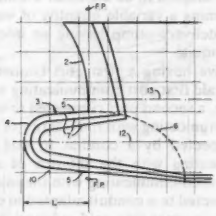
1. A bottom-dump cargo vessel comprising in combination, two pontoons forming longitudinal walls and bottom walls of a cargo space and hinged together for movement about a longitudinal effective hinging axis between a first terminal position in which said cargo space is closed at the bottom and a second terminal position in which said cargo space is open at the bottom; jack means for moving said pontoons into said first terminal position; and locking means each comprising an articulated pair of locking rods forming a linkage with the two pontoons, the rods of each articulated pair of locking rods being each pivoted to the keel of a different pontoon and in their two terminal positions corresponding to the two terminal positions of the pontoons extend in substantially the same direction; a jack acting on a common pivot of said rods of a pair of locking rods and extending in a substantially vertical direction, said jack acting on said common pivot extends upwardly beyond the pivot which it has in common with one of said pontoons.

3,946,687

CONICAL BULBOUS BOW

Walter F. Taylor; William G. Rodgers, Jr., and John R. Chappell, all of Newport News, Va., assignors to Newport News Shipbuilding and Drydock Company, Newport News, Va.

Filed Aug. 6, 1974, Ser. No. 495,166
Int. Cl.² B63B *1/06*
U.S. Cl. 114—56 21 Claims



11. A ship with a bulbous bow, said bulbous bow consisting essentially of,

a conical portion with a larger and a smaller end,

a faired nose attached at said smaller end,

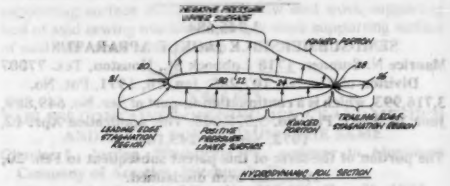
said conical portion extending at least as far as a forward perpendicular of said ship with the larger end of said conical portion attached to the ship's prow, the longitudinal center line of said conical portion substantially parallel to the longitudinal axis of said ship.

3,946,688

HYDRODYNAMIC SECTIONS

Robert J. Gornstein, and Kenneth R. Meldahl, both of Bellevue, Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 207,414, Dec. 13, 1971, abandoned.
This application Nov. 12, 1973, Ser. No. 414,992
Int. Cl.² B63B *1/18*
U.S. Cl. 114—66.5 H 3 Claims



2. A hydrodynamic section having an elongated axis and being suitable for use as a boat hydrofoil when moved through a liquid in the direction defined by said elongated axis, said seciton comprising:

first surface means defining a continuous first surface, said first surface contoured such that a negative pressure zone forms over said first surface when said hydrodynamic section is moved through a liquid, said negative pressure zone including a kinked portion rearwardly disposed along said first surface with respect to said direction of travel for stabilizing the boundary layer to prevent liquid separation, the negative pressure of said kinked portion being relatively lower than the negative pressure of the other portions of the negative pressure zone formed over said first surface;

second surface means defining a continuous second surface, said second surface contoured such that a positive pressure zone forms over said second surface when said hydrodynamic section is moved through a liquid, said positive pressure zone including a kinked portion rearwardly disposed along said second surface with respect to said direction of travel for stabilizing the boundary layer to prevent liquid separation, the positive pressure of said kinked portion being relatively lower than the positive pressure of the other portions of the positive pressure zone formed over said second surface;

the mean line between said first and second surfaces being defined by the hydrodynamic equation:

$$Y_c'(\theta_o) = -\frac{1}{2\pi}\int_o^{\pi} \frac{{}^{C}P_{Basic}\sin\theta}{\cos\theta-\cos\theta_o}\,d\theta$$

and wherein the thickness between said first and second surfaces is defined by the hydrodynamic equation:

$$\frac{Y'(\theta_o)}{\sqrt{\rho}} = -\frac{2}{1+f}\,\frac{\sqrt{a/A}}{\cos\phi-\cos\theta_o}$$

wherein:

${}^{C}P_{Basic}$ is a pressure distribution equation having kinked portions located between the midpoints of said hydrodynamic section and said trailing edge;

$Y'_c(\theta_o)$ is the normalized separation distance between the mean line and said elongated axis of the hydrodynamic section at $\theta=\theta_o$;

θ is the argument of the position vector of the transformed surface;

θ_o is an arbitrary location of θ;

$Y_t'(\theta_o)$ is the normalized thickness distribution between

said surfaces at $\theta=\theta_o$;

ρ is a chosen parabolic thickness distribution constant;

Φ is the value of θ at the leading edge; and,

A, a and f are transformation constants determined by the desired pressure distribution;

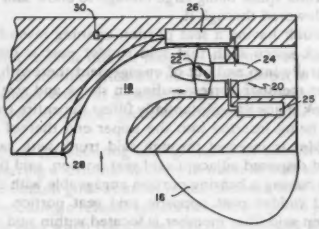
said first and second surface means joining to define a leading edge, said leading edge being formed such that a positive pressure zone forms about said leading edge when said hydrodynamic section is moved through a liquid; and,

said first and second surface means joining to define a trailing edge, said trailing edge being formed such that a positive pressure zone forms about said trailing edge when said hydrodynamic section is moved through a liquid.

3,946,689
AIR DYNAMO PRESSURE REGULATION AND MODULATION DEVICE FOR SURFACE EFFECT SHIPS AND AIR CUSHION VEHICLES

Albert H. Robbins, 1415 Larch Road, Severn, Md. 21144, and Freddie W. Wilson, 1925 Grace Church Road, Silver Spring, Md. 20910

Filed July 26, 1974, Ser. No. 492,313
Int. Cl.² B63B *1/38*
U.S. Cl. 114—67 A **5 Claims**



1. In a vehicle which travels on a cushion of air which is contained within a plenum chamber and which is vented to the atmosphere, the improvement comprising:

a duct leading from said plenum chamber to the atmosphere through which said air is vented;

an air powered energy conversion device driving a second energy conversion device within said duct operated by said vented air; and

means to vary the resistance to flow through said duct and said energy conversion devices.

3,946,690
STEERING LARGE VESSELS

Leopold C. van Holtz, and Wouter K. Wolters, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 5, 1975, Ser. No. 555,500
Claims priority, application United Kingdom, Mar. 11, 1974, 10741/74
Int. Cl.² B63H *25/04*
U.S. Cl. 114—144 E **7 Claims**

1. A process for stabilizing the course angle of a large ship comprising:

measuring the variation of the course angle with time and producing a course angle signal:

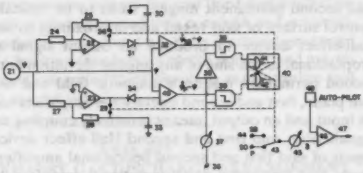
producing a maximum course angle signal when the measured variation related thereto of the course angle with time reaches an extreme value;

comparing said maximum course angle signal with the instantaneous course angle signal and producing a course stabilizing signal; and

utilizing said course stabilizing signal to move the ship's rudder through a predetermined discrete angle relative to a neutral position, the rudder being reset towards starboard if the said extreme value is in the starboard direction and towards port if the said extreme value is in the port direction.

5. An apparatus for stabilizing the course angle of a ship comprising:

course measuring means disposed on the ship to measure the actual course of said vessel and supply a course signal related thereto;



peak amplitude measuring means, said peak amplitude measuring means being coupled to said course measuring means to detect the peak amplitude of said course signal;

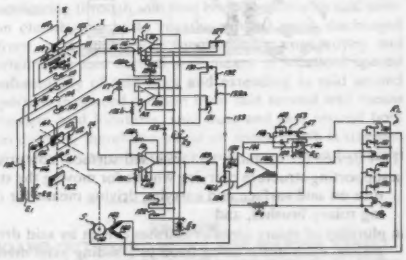
a subtracting circuit, said subtracting circuit being coupled to both said peak amplitude measuring means and said course measuring means to supply a difference signal related to the difference between said peak amplitude and the actual course; and

switch means coupled to said subtracting circuit and responsive to said difference signal to move the rudder a predetermined discrete angle towards starboard if the said peak amplitude is in the starboard direction and towards port in the opposite case whenever said difference signal exceeds a preset limit.

3,946,691
AUTOPILOT EMPLOYING IMPROVED HALL-EFFECT DIRECTION SENSOR

Robert M. Freeman, Tacoma, Wash., assignor to Metal Marine Pilot, Inc., Tacoma, Wash.

Continuation of Ser. No. 407,139, Oct. 17, 1973, abandoned, which is a division of Ser. No. 183,791, Sept. 27, 1971, Pat. No. 3,906,641. This application June 23, 1975, Ser. No. 589,269
Int. Cl.² B63H *25/02*
U.S. Cl. 114—144 E **26 Claims**



1. A marine autopilot system for automatically controlling the course of a vessel, said system including a marine compass having a reference line aligned with the longitudinal axis of the vessel, a compass card within said marine compass including a first permanent magnet producing a magnetic field, said compass card being relatively rotatable with respect to said reference line in response to deviation thereof from the horizontal component of the earth's magnetic field, a course dial within said marine compass rotatable with respect to said reference line for presetting a desired course, a first Hall-

effect device mounted on said course dial and in proximity to said first permanent magnet, a source of DC constant current connected to said first Hall-effect device for establishing a null plane, said first Hall-effect device providing an output signal proportional to the sine of any angular deviation between said first permanent magnet's magnetic field and said null plane, a control surface sensor including a second Hall-effect device, means maintaining said second Hall-effect device in fixed relation to the longitudinal axis of the vessel, a second source of DC constant current connected to said second Hall-effect device for establishing a second null plane, a second permanent magnet producing a magnetic field, means supporting said second permanent magnet so as to be rotatable with a control surface of said vessel and in proximity to said second Hall-effect device to produce an output signal therefrom proportional to the sine of any angular deviation between said second permanent magnet's magnetic field and said second null plane, first and second operational amplifiers each having an input and an output, means resistively coupling said output signals from said first and second Hall-effect devices to said inputs of said first and second operational amplifiers, respectively, said first and second operational amplifiers amplifying said output signals to provide desired course and rudder angle signals, respectively, on said outputs, a differential amplifier coupled to said first and second operational amplifiers for providing a control signal denoting a desired direction of control surface movement whenever the difference between said desired course and rudder angle signals exceeds a predetermined value, and control means responsive to said control signal for controlling the position of said control surface.

3,946,692
DEVICE FOR CLEANING SHIP'S HULLS AND OTHER IMMERSED SURFACES

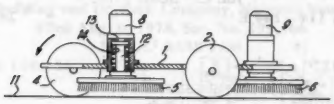
Charles Sierra, and Pierre Pince, both of Marseille, France, assignors to Phoceenne Sous Marine - PSM Les Hommes Grenouilles Du Port De Marseille, Marseille, France

Filed Dec. 20, 1974, Ser. No. 535,126

Claims priority, application France, Dec. 28, 1973, 73.46978

Int. Cl.² B63B *59/00*

U.S. Cl. 114—222 **8 Claims**



1. A device for cleaning an immersed surface, comprising:

a supporting structure carrying wheels for moving the structure on said surface and carrying driving means for driving rotary brushes, and

a plurality of rotary circular brushes driven by said driving means, each brush being fixed to a sliding axial member which bears on the structure through a calibrated spring, said spring being compressed by the sliding of the said axial member in response to the rotation of said brush, each of said rotaty circular brushes having bristles for cleaning the surface and a central space which is free of bristles, the bristles of each brush being arranged in tufts which are distributed between said central space and the periphery of the brush in rows so as to define flow channels which are flared towards the periphery of the brush, said flow channels conducting streams of water from the central space to the periphery of said brush.

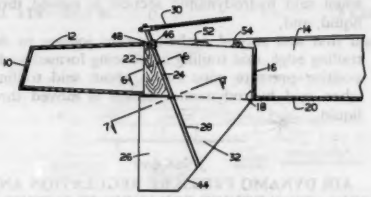
3,946,693
REMOVABLE INBOARD RUDDER

Marshall S. B. Brown, 1041 Avon Blvd., Cheshire, Conn. 06410

Continuation of Ser. No. 420,383, Nov. 30, 1973, abandoned. This application Mar. 3, 1975, Ser. No. 555,076

Int. Cl.² B63H *25/06*

U.S. Cl. 114—165 **6 Claims**



1. A removable inboard-rudder steering device for a boat comprising

a trunk or housing mounted in the hull of the boat for providing access through the bottom of the boat, said trunk having a hollow space that is open at both the top and bottom,

a rudder assembly comprising a rudder post and a rudder rigidly fixed to the lower end of said post;

said trunk space being large enough to allow said rudder to be lowered through it,

said trunk having a seat portion opening inwardly of said trunk space such that said rudder post is displaceable laterally into and out of engagement therewith,

a filler member corresponding in shape and size with said trunk space for substantially filling the entire trunk space on being inserted into the upper end thereof after said rudder is inserted through said trunk with said rudder post disposed adjacent said seat portion, said filler member having a bearing portion engageable with the side of said rudder post opposite said seat portion, such that when said filler member is located within said trunk said rudder post is held by said filler member against said seat portion for pivotal movement within said trunk, and

means for locating said rudder post vertically with respect to said trunk.

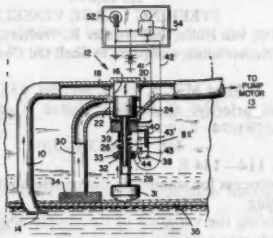
3,946,694
AUTOMATIC EMERGENCY BILGE WATER PUMPOUT SYSTEM

Robert Belsky, 2124 E. 38th St., Brooklyn, N.Y. 11234

Filed June 24, 1974, Ser. No. 482,324

Int. Cl.² B63B *13/00*

U.S. Cl. 114—183 R **4 Claims**



1. In a boat hull, an emergency pumping system comprising, in combination with the boat engine's water pump, a through-hull water intake pipe having an open end submerged in water below the boat's hull and another end connected with said water pump, valve means disposed intermediate said through-

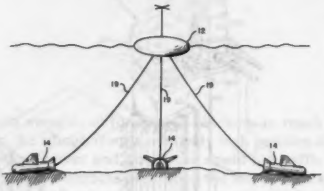
hull pipe's ends, said valve means having a first inlet port for said through-hull intake pipe, an outlet port communicating with said pump, a second inlet port, an emergency water intake pipe having a free end positioned inwardly of said hull and another end connected with said second port, a float for operating said valve for closing said first port, while opening said second port, said float being operable when water reaches a dangerous level in the boat.

3,946,695

SELF-DEPLOYING MULTIPLE ANCHOR MOORING SYSTEMS

Robert D. Isaak, Bellevue, Wash., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 28, 1975, Ser. No. 572,361
Int. Cl.² B63B *21/24*
U.S. Cl. 114—206 R **11 Claims**



1. A multiple anchor marine mooring system comprising:

a plurality of marine anchors, each configured to stably glide through water at a predetermined depression when at a velocity at least as great as its minimum glide velocity;

carrier means for securing said plurality of anchors in a cluster having a terminal velocity in water at least as great as the minimum glide velocity of the anchors, said carrier means including a release system for releasing said plurality of anchors when the cluster attains a velocity at least as great as the minimum glide velocity;

a buoyant body; and

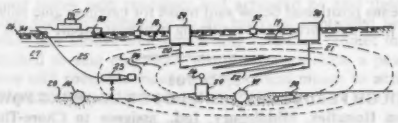
cable means for connecting said plurality of anchors to said buoyant body.

3,946,696

AUTOMATICALLY CONTROLLED MAGNETIC MINESWEEPING SYSTEM

Harold Lubnow, Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 5, 1969, Ser. No. 889,853
Int. Cl.² B63B *9/00*
U.S. Cl. 114—221 R **18 Claims**



1. A method of sweeping magnetically responsive marine mines to effect detonation of those thereof that are not located within destructive proximity of the minesweeping ship effecting the sweep thereof and to not effect detonation of those thereof that are located within destructive proximity of said minesweeping ship, comprising the combined steps of:

generating a magnetic field within the water and sea floor where said magnetically responsive marine mines are suspected of being located;

sensing the intensity of said magnetic field at a predetermined distance from said ship and producing a first signal proportional thereto;

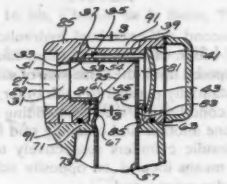
controlling the intensity of said sensed magnetic field to prevent it from extending close enough to said minesweeping ship to detonate a magnetically responsive marine mine that may be in destructive proximity therewith by comparing said first signal that is proportional to said sensed magnetic field with a preset second signal that is calibrated to be proportional to a known distance from said minesweeping ship and producing a third signal that is proportional in polarity and magnitude to the difference therebetween; integrating said third signal in accordance with a predetermined time constant; and automatically regulating the generating of the aforesaid generated magnetic field in accordance with the polarity and magnitude of said integrated third signal, so as to equalize said first and second signals.

3,946,697

ENGINE EXHAUST GAS DISCHARGE ARRANGEMENT

Eugene R. Hackbarth, Kenosha, Wis.; George E. Miller, Libertyville, Ill.; H. Norman Petersen, Kenosha, Wis.; John D. Sheldon, Zion, Ill., and Harry M. Ward, III, Waukegan, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Nov. 4, 1974, Ser. No. 520,434
Int. Cl.² B63H *21/34*
U.S. Cl. 115—.5 E **9 Claims**



1. An engine comprising an engine block including first wall means defining a combustion chamber, and second wall means defining a bore including a first portion extending from said combustion chamber and a second portion enlarged with respect to said first portion and substantially closed from the atmosphere, and an elongated duct of heat resistant material communicating through said first bore portion with said combustion chamber so as to receive exhaust gases discharged therefrom, said duct being longitudinally engaged by and supported from said second wall means at locations spaced circumferentially of said duct and extending in said second bore portion in spaced relation from said second wall means intermediate said locations, said duct and said second bore portion defining therebetween an air space which is stagnant during operation so as to reduce heat transmission from said duct.

3,946,698

INBOARD-OUTBOARD DRIVE FOR MARINE VESSEL

Robert L. LaFollette, Baldwinsville, and Kenneth H. Miller, Syracuse, both of N.Y., assignors to American Challenger Corporation, Louisville, Colo.

Filed Aug. 29, 1974, Ser. No. 501,841
Int. Cl.² B63H *1/14*
U.S. Cl. 115—35 **14 Claims**

1. An inboard-outboard drive unit for marine vessel, comprising:

an upper portion adapted to be tiltably mounted to the stern structure of the vessel and a lower portion rotatably coupled to said upper portion;

first drive means disposed in said upper portion and adapted to be coupled to a source of motive power inboard of said vessel;

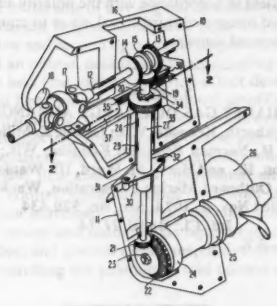
second drive means disposed in said lower portion and having propeller means attached thereto;

intermediate drive means coupling said first and said second drive means and comprising a shaft extending from said upper portion to said lower portion;

tubular means journaled in said upper portion and disposed concentrically about said intermediate drive means;

steering means fixedly coupled to said tubular means;

means coupling said tubular means to said lower portion to cause said lower portion to rotate therewith;



first and second self-contained hydraulic cylinder means disposed within said upper portion, said cylinder means being disposed upon the same side of said steering means and substantially parallel to each other;

first and second linkage means extending substantially parallel to one another and coupling said first and said second hydraulic cylinders respectively to points on said steering means located on opposite sides of the axis of said tubular means; and

means for selectively actuating said hydraulic cylinder means for effecting rotational movement of said lower portion with respect to said upper portion.

3,946,699

AUTOMATIC FLAG STORAGE AND DISPLAY DEVICE

Richard C. Mirshak, Succasunna, N.J., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Dec. 6, 1974, Ser. No. 530,291

Int. Cl.² G09F *17/00*

U.S. Cl. 116—174 **10 Claims**

1. an automatic flag storage and display device comprising:

a. a hollow tubular member;

b. a first pole member supported within the tubular member so that the axis of the tubular member and the axis of the first pole member are parallel and said first pole member is adapted for extension and retraction therefrom and thereinto;

c. a second pole member pivotally mounted to the outward end of the first pole member;

d. a release means for automatically extending the second pole member so as to unfurl a flag attached to the first and second pole members when the first pole member is extended from the hollow tubular member;

e. a pole extension means for automatically extending the first pole member.

3,946,700

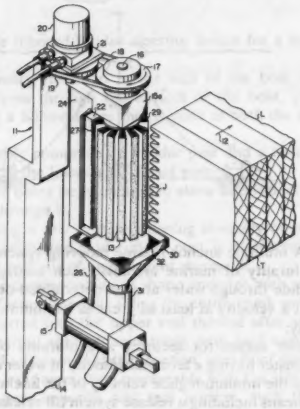
GLUE APPLICATOR

Jeff Y. Cromeens, Garland, Tex., assignor to Industrial Woodworking Machine Co. Inc., Garland, Tex.

Filed Mar. 19, 1974, Ser. No. 452,612

Int. Cl.² B05C *1/02*

U.S. Cl. 118—259 **3 Claims**



2. A glue applicator for applying glue to an uneven upright surface comprising

an upright rotary brush;

glue delivery means for the brush including

a doctor block positioned beside said brush and having an upright surface oriented parallel to the axis of said brush and spaced therefrom a distance less than the nominal radius of the brush,

a glue feed compartment in the upright surface of the doctor block for receiving and applying glue to said brush and being in the form of a multiplicity of transverse serrations;

glue supply means;

said doctor block having a passage in communication with the glue feed compartment and the glue supply means; and

means positioned below said brush for catching glue falling from said brush and returning it to said supply means.

3,946,701

TROUGH FEEDER WITH SHIELD FOR GROWING FOWL

Eldon Hostetler, Middlebury, Ind., assignor to Chore-Time Equipment, Inc., Milford, Ind.

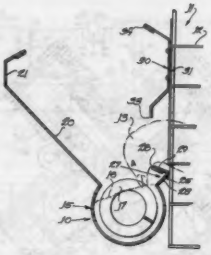
Filed Jan. 14, 1974, Ser. No. 433,364

Int. Cl.² A01K *31/00*

U.S. Cl. 119—18 **2 Claims**

1. For use with a trough feeder for chickens and like animals retained in cages, said trough feeder having a trough for carrying feed and defined by at least one member located adjacent the cages, a trough feeder shield, the shield having at its top a diagonally outwardly and upwardly extending anti-rake baffle portion and shield mounting means, the mounting

means including sliding strip members mounted to the cages adjacent the trough and carrying the shield at a first position adjacent the cages and spaced above the trough side member to permit small chickens to reach the feed carried in the trough from a relatively low position above the trough side member and below the shield bottom, and at a second position adjacent the cages and lowered into engagement with the



trough side member to force large chickens to reach the feed carried in the trough from a relatively high position above the trough side member and above the shield top baffle portion, the sliding strip members permitting the shield to be non-rotatably slid vertically along the cage between said first and said second positions, whereby to inhibit said large chickens from raking or tossing feed out of the trough feeder.

3,946,702

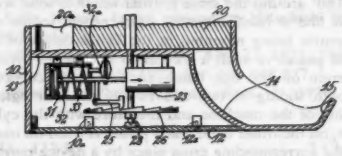
AUTOMATIC ANIMAL FEEDERS

Anthony E. Mazzini, 437 W. Roscoe St., Chicago, Ill. 60657

Filed Nov. 18, 1974, Ser. No. 524,346

Int. Cl.² A01K *5/02*

U.S. Cl. 119—51.13 **8 Claims**



1. An animal feeder comprising a housing, a food container rotatable therein and formed with circularly-spaced food compartments, a food-dispensing outlet in the lower part of the housing, the food compartments being adapted to register consecutively with the outlet on the periodical rotation of the food container, an automatic timer, and a motive unit positioned below said container and activated by said timer to rotate the food container at the intervals controlled by the timer, said motive unit comprising rotatable ratchet means attached to said container, piston means include a pawl to move said rotatable means and electrical means to activate said piston means in response to said timer.

3,946,703

LIQUID FEEDER FOR ANIMALS

G. F. Roy Wheat, Oneonta, Ala., assignor to Hold 'Em, Inc., Oneonta, Ala.

Filed Nov. 15, 1974, Ser. No. 523,975

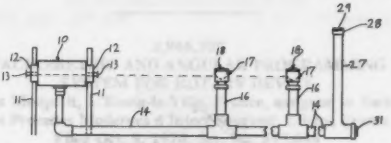
Int. Cl.² A01K *7/00*

U.S. Cl. 119—75 **6 Claims**

1. A liquid feeder for animals comprising:

a. a receptacle for receiving liquid feed and having an opening in the upper end thereof, (and)

b. a spherical member mounted for rotation in said receptacle in position to float in the liquid feed carried by said receptacle with a portion of said spherical member projecting upwardly through said opening with the upper surface of said spherical member in position for an animal to lick and thus rotate said spherical member to transfer feed to the upper surface thereof, and



c. a feed supply chamber communicating with said receptacle and mounted at an elevation for the liquid feed to flow by gravity to said receptacle with the maximum height of the liquid level in said supply chamber being at an elevation subjacent the elevation of the upper end of said receptacle so that liquid feed will not overflow from said receptacle by gravity.

3,946,704

APPARATUS FOR CONTROLLING TRANSIENT OCCURRENCES IN AN ELECTRONIC FUEL INJECTION SYSTEM

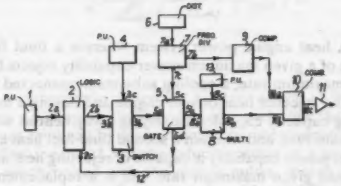
Louis Monpetit, 16 bis, Chemin de la Butte, 78-L'Etang-la-Ville, France

Filed June 24, 1974, Ser. No. 482,137

Claims priority, application France, June 27, 1973, 73.23450

Int. Cl.² F02B *3/00*

U.S. Cl. 123—32 EA **11 Claims**



1. Apparatus for producing auxiliary control signals in an electronic fuel injection system for an engine of a motor vehicle in response to transitory changes in an operating condition of said engine comprising:

means for sensing said operating condition and producing a first signal corresponding thereto,

means responsive to abrupt changes in said first signal for producing a controlled duration output signal,

means for producing a series of pulses corresponding to the speed of rotation of the engine,

gate means receiving at one input thereof said controlled duration output signal and at another input thereof said series of pulses, said gate means delivering output pulses at the frequency of the series of pulses applied to its other input upon the application of said controlled duration output signal to its one input,

means for receiving said output from said gate means for producing said auxiliary control signals with a controlled duration,

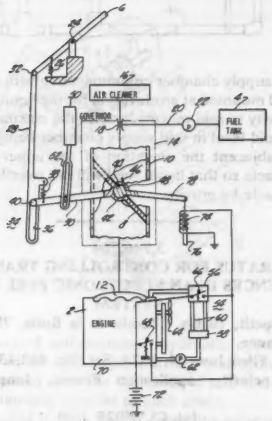
computer means for producing normal fuel injection control signals, and

means for combining said auxiliary and said normal injection control signals to produce a composite control signal.

3,946,705
HEAT ENGINE POWER SYSTEM

Roland A. Magnuson, Seattle, Wash., and Richard W. Siorek, Warren, Mich., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 30, 1974, Ser. No. 510,525
Int. Cl.² F01P 7/02
U.S. Cl. 123—41.13 7 Claims



1. A heat engine power system wherein a fluid fuel heat engine of a given maximum power capability rejects heat at a given maximum rate, a cooling subsystem connected to carry away the rejected heat of said engine and having a maximum cooling capacity capable of carrying away heat at said given maximum rate, and wherein a second fluid fuel heat engine of a larger power capability is capable of rejecting heat at greater than said given maximum rate and is a replacement in the system for the first-named engine, the invention consisting of fuel controls enabling use of either engine without overloading the cooling subsystem, the system comprising:

a. a throttle having a first operating position in which the throttle is capable of admitting as much fuel as will enable operation of the first-named engine at its maximum output and within the cooling capacity of the cooling subsystem and would enable operation of the replacement engine at its maximum output and rejecting heat at a substantially greater rate than said given maximum rate, which substantially greater rate would overload the cooling subsystem and cause mechanical failure of the system, and a second operating position in which the throttle limits fuel flow to the replacement engine to a rate which limits heat rejection by the replacement engine to a rate that is within the cooling capability of the cooling subsystem;

b. speed control means operably connected to actuate the throttle throughout its entire operating range including said first and second operating positions;

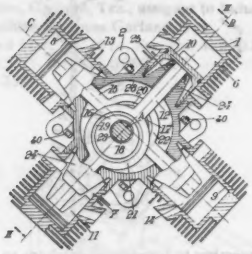
c. temperature-responsive means for detecting overloading of the cooling subsystem; and

d. means under control of the temperature responsive means for limiting the throttle opening to said second operating position.

3,946,706
ROTARY MACHINES COMPRISING FOUR CYLINDERS IN A STAR

Yves Pailler, Cieux, France

Filed June 10, 1974, Ser. No. 478,104
Claims priority, application France, June 14, 1973, 73.22378
Int. Cl.² F02B 75/22, 75/24
U.S. Cl. 123—56 BC 8 Claims



1. Rotary machine of the explosion engine type, pumps, or compressors including: a rotary shaft with axis A; four cylinders in a star aligned in pairs on two axes B and C perpendicular to the axis A and to each other, axis B lying in one plane and axis C being in a further separate plane; a first assembly of two pistons suitable to slide within two of the said cylinders and connected together head to tail by a first rigid cross piece; a second assembly of two pistons suitable to slide within the other two cylinders and connected together head to tail by a second rigid cross piece; and a mechanism suitable to transform the alternating slidings of these two assemblies into rotation of the shaft or conversely, said mechanism including two eccentrics solid with each other and mutually out of phase by 180° around the same journal which is solid with the said shaft and is itself eccentric with respect to the shaft, each eccentric being mounted in the central zone of one of the cross pieces in such a way as to be able to pivot within it, wherein on the one hand, each cross piece is guided for smooth sliding in two sleeves which are integral with the casing of the machine and therefore with the cylinders and that, on the other hand, each piston is fixed on one extremity of the corresponding cross piece by a device permitting relative transverse, but not longitudinal, displacements of said piston relative to the said cross piece.

3,946,707
ELECTRONIC VEHICLE SPEED CONTROL

Larry O. Gray, Greens Fork, Ind., assignor to Dana Corporation, Toledo, Ohio

Filed July 24, 1974, Ser. No. 491,444
Int. Cl.² F02D 11/10; B60K 27/00
U.S. Cl. 123—102 9 Claims

1. A speed control for a vehicle having a vacuum source and a vehicle throttle means moveable in two directions to increase and decrease vehicle speed comprising:

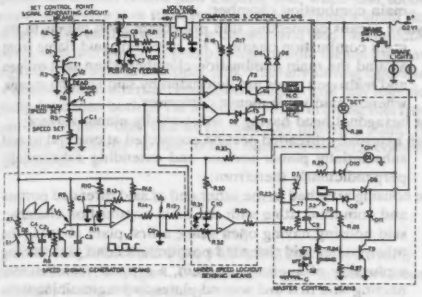
a. a vacuum bellows connected to and operable upon an increase in vacuum therein to move said throttle in the speed increasing direction;

b. a first valve means operatively connected to selectively communicate between said vacuum source and said vacuum bellows;

c. a second valve means operatively connected to selectively communicate between said bellows and the atmosphere;

d. a first speed signal means producing a signal proportional to the desired vehicle speed;

e. a second speed signal means producing a signal proportional to the actual vehicle speed;
f. dead-band signal means associated with one of said speed signal means;
g. comparator means receiving signals from said first and second speed signal means and said dead-band signal means and connected to said valves whereby said first valve provides its said communication when the vehicle



speed is too low by reference to said set point speed and said second valve provides its said communication when the vehicle speed is too high with reference to said set point speed and both said first and said second valves do not provide their said communication over a narrow range determined by said dead band; and
h. a means to maintain said second valve in its said communication when the speed of said vehicle is less than said set speed by more than a predetermined amount.

3,946,708

DEVICE FOR ADJUSTING IGNITION TIME FOR INTERNAL COMBUSTION ENGINE

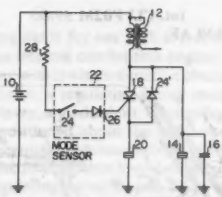
Toshikazu Saita, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 173,986, Aug. 23, 1971. This application Oct. 19, 1973, Ser. No. 408,077

Claims priority, application Japan, Sept. 1, 1970, 45-86979[U]

Int. Cl.² F02P *5/04*

U.S. Cl. 123—117 R **2 Claims**



1. In an ignition system: a supply of electrical energy; a first set of breaker contacts operative for effecting timing of said ignition system in a first timing mode; an ignition coil having a primary winding connected in series with said first set of breaker contacts and said supply of electrical energy; a second set of breaker contacts operative for effecting timing of said ignition system in a second timing mode; switching means comprising a thyristor connected to said first set of breaker contacts and said second set of breaker contacts and operable for disconnecting and connecting said second set of breaker contacts in parallel with the first set of breakers contacts thereby selecting said first timing mode and said second timing mode; and means for enabling said thyristor to disconnect or connect said second set of breaker contacts in parallel with said first set of breaker contacts thereby enabling the opening and closing of said first and second sets of breaker contacts respectively to control the conduction of said thyristor and the timing of the ignition system.

3,946,709

TACHOMETRIC AND ANGULAR PROGRAMMING SYSTEM FOR ROTARY DEVICE

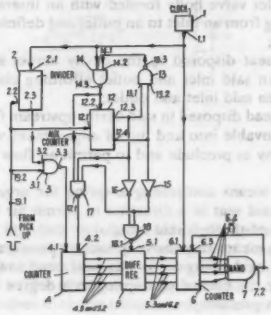
Louis Monpetit, L'Etang-la-Ville, France, assignor to Societe des Procedes Modernes d'Inject Sopromi, Clichy, France

Filed Oct. 8, 1974, Ser. No. 513,046

Claims priority, application France, Oct. 17, 1973, 73.37020

Int. Cl.² F02P *5/04*

U.S. Cl. 123—117 R **11 Claims**



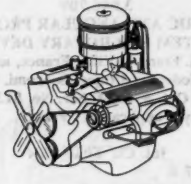
1. In a tachometric system for a rotary device of the type including a pickup for delivering a pulse each time the rotary device has revolved by a given angle the improvement comprising first means (**2.3**) for producing pulses at a given frequency synchronized with the pickup pulses, means (**4**) for counting the number of pulses produced by said first means during a period separating two successive pulses delivered by the said pickup, second means (**1**) for producing pulses at a frequency greater than the frequency of the pulses from the first means, and output means (**5,6**) for producing output pulses whose period between two of its successive output pulses corresponds to a number of periods between successive pulses from said second means depending on the number of pulses from said first means counted by the said counting means, a plurality of serially connected counting means (**8.7** to **8.9**), a respective storage means (**8.10** to **8.12**) connected to the output of each of said counting means for producing a number formed by a plurality of bits, one of said storage means (**8.10**) corresponding to the bits of lowest weight, logic circuit summation means (**8.37** to **8.41**), said one storage means (**8.10**) coupled to said logic circuit summation means, and preselection counter means (**8.21** and **8.22**), the other of said storage means (**8.11, 8.12**) connected to said preselection counter means and said preselection counter means connected to said counting means (**4**) for making the period of the output pulses from said output means (**5,6**) correspond to a number of periods of the second pulses from said second means (**1**) depending on the number formed by the bits of greater weight from said storage means, the bits of lesser weight intervening only as correction elements.

3,946,710

SUPPLEMENTAL AIR VALVES AND SUPPLEMENTAL AIR SYSTEMS FOR INTERNAL COMBUSTION ENGINES

Joseph L. Albano, Irvine, and Hugh H. Harren, Anaheim, both of Calif., assignors to Albano Enterprises, Inc., Santa Ana, Calif.

Filed Mar. 20, 1972, Ser. No. 236,013
Int. Cl.[2] F02B *33/00*; F02M *7/00*
U.S. Cl. 123—119 B 5 Claims



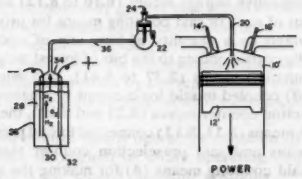
1. In combination:
an air inlet valve body formed with an internal cavity extending from an inlet to an outlet and defining a flowpath for air;
a valve seat disposed in the cavity across said flowpath between said inlet and outlet affording communication between said inlet and outlet;
a valve head disposed in said cavity upstream from said seat and movable into and out of engagement with said seat whereby to preclude and to permit air flow from inlet to outlet;
resilient means comprising a spring for urging said head from said seat in a direction to permit air flow past the head and through said seat;
actuating means responsive to suction pressure at the outlet end of said cavity for urging said head toward said seat against the bias of said spring in a degree variable with suction pressure;
means for connecting said cavity at its outlet to the fuel and air inlet system of an internal combustion engine and to the crankcase of said engine at a point immediately downstream from the point at which fuel is mixed with air; and
a PCV valve interconnected in series with said means for connecting said cavity to the engine crankcase;
the maximum flow rate through the PCV valve being substantially twice the maximum flow rate through the air valve.

3,946,711

HYDROGEN FIRED IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Voorhis F. Wigal, 909 Highland Ave., Jackson, Tenn. 38301

Filed Apr. 8, 1974, Ser. No. 458,816
Int. Cl.[2] F02B *33/00*
U.S. Cl. 123—119 E 6 Claims



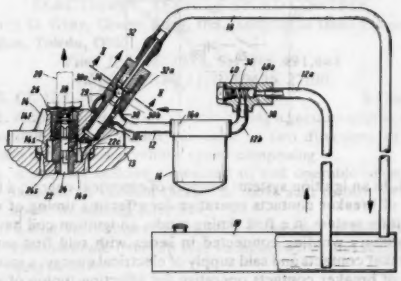
1. A combustion system for operating an internal combustion engine, having a main combustion chamber which may contain a vaporized fuel-air mixture, comprising:
igniting means located remote from the main combustion chamber for creating a spark;
supply means for supplying hydrogen and oxygen gases to said igniting means;
pre-combustion means housing said igniting means and connected to the main combustion chamber for projecting an explosive flame front created by the detonation of said hydrogen and oxygen gases by said igniting means into the main combustion chamber to ignite the vaporized fuel-air mixture when the fuel-air mixture is present in the main combustion chamber;
valve means connecting said pre-combustion means to the main combustion chamber for spreading said flame front around the main combustion chamber when said oxygen and hydrogen gases are detonated by said igniting means, wherein said valve means comprises;
a hexagonal head having a substantially planar surface;
an externally threaded portion connected at one end to said substantially planar surface and extending substantially perpendicularly therefrom;
a housing attached to the other end of said threaded portion and communicating with the main combustion chamber, said housing having open sides, a first plate abutting the other end of said threaded portion, a second plate having a plurality of apertures therein, a support member connecting said first and second plates and maintaining them in a substantially parallel relationship, and a disc valve movably sandwiched between said first and second plates; and
transporting means communicating with said housing through said first plate for transporting said hydrogen and oxygen gases from said precombustion means to said housing through said hexagonal head and said threaded portion,
wherein, during detonation of the hydrogen and oxygen gases by said igniting means, said disc valve is forced into contact with said second plate thereby forcing said flame front out of said open sides of said housing, and wherein, during firing of the vaporized fuel-air mixture, when it is present in the main combustion chamber, said disc valve is forced into contact with said first plate and said transporting means thereby preventing backflow of exhaust into the pre-combustion means.

3,946,712

INJECTION INTERNAL COMBUSTION ENGINE

Gottfried Hatz, and Heinz Eibl, both of Ruhstorf, Germany, assignors to Motorengabrik Hatz KG., Ruhstorf, Germany

Filed July 25, 1974, Ser. No. 491,692
Claims priority, application Germany, Aug. 31, 1973, 2344002
Int. Cl.[2] F02M *39/00*
U.S. Cl. 123—139 AF 6 Claims



1. In an injection internal combustion engine having at least one fuel injection pump which is connected to the fuel supply tank through a suction conduit having a first non-return valve

connected in circuit therewith, and in which fuel in excess of that used in an injection is conducted back to the supply tank through a return flow conduit separate from said suction conduit and likewise including a second non-return valve therein, the improvement comprising wherein the lowermost part of said fuel supply tank and an outlet therefrom are physically located below said fuel injection pump, said first non-return valve is a fullyclosing non-return valve connected in the suction conduit, said second non-return valve being connected in said return flow conduit and, when said second non-return valve is in its seated position, permits a small flow of fuel between the return flow conduit and said fuel injection pump, said fuel injection pump being the sole means for drawing fuel from said fuel supply tank whereby during operation of said injection internal combustion engine said fuel injection pump functions both as (1) a suction pump drawing fuel from said fuel supply tank and as (2) said fuel injection pump for injecting a quantity of fuel to said injection internal combustion engine.

3,946,713

RPM REGULATOR FOR FUEL INJECTION PUMPS

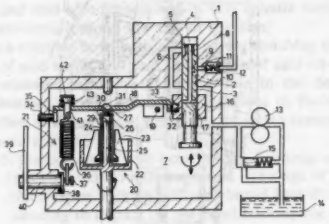
Helmut Laufer, Stuttgart, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Sept. 26, 1974, Ser. No. 509,676

Claims priority, application Germany, Oct. 3, 1973, 2349553

Int. Cl.² F02D *1/04;* **F02M** *59/24*

U.S. Cl. 123—139 AD **4 Claims**



1. In an rpm regulator for use with a fuel injection pump associated with an internal combustion engine, said regulator including a housing within which a suction chamber is defined, an intermediate lever, a regulating spring means coupled to the intermediate lever, a guide shaft, a centrifugally operating governor sleeve positioned about the guide shaft and having its front end adjacent the intermediate lever for transmitting an rpm signal to the intermediate lever in opposition to a force exerted by the regulating spring means, and a working chamber defined by a space between an end of the guide shaft and the inside surface of the governor sleeve, the improvement comprising:

a. a throttle aperture formed in the wall of the governor sleeve for providing fluid communication between the working chamber and the suction chamber; and

b. at least one controllable relief bypass means connected to the governor sleeve for providing selective fluid communication between said working chamber and said suction chamber over a portion of the relative positional range of said governor sleeve with respect to said guide shaft whereby damping is effective over a predetermined load range.

3,946,714

FUEL INJECTION SYSTEM

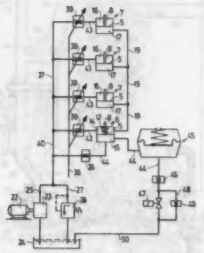
Konrad Eckert, Stuttgart-Feuerbach, and Gerhard Stumpp, Stuttgart, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Mar. 13, 1975, Ser. No. 558,005

Claims priority, application Germany, Mar. 16, 1974, 2412808

Int. Cl.² F02M *39/00;* **F02B** *3/00*

U.S. Cl. 123—139 AW **5 Claims**



1. In a fuel injection system for externally ignited internal combustion engines comprising: a plurality of fuel injection valves; a distributor unit; means including a fuel supply line for supplying fuel to the distributor unit; and means connecting the injection valves to the distributor unit, the distributor unit including: a plurality of metering valves which are displaceable in common to vary their flow passage section and which regulate the quantity of fuel flowing to the injection valves, the metering operation being carried out with a constant pressure difference; an equal plurality of pressure valves, at least one of which is in the form of a differential pressure control valve and the remainder of which are in the form of constant pressure valves; and means connecting the pressure valves to respective ones of the metering valves, said pressure valves being located in the fuel flow downstream of the metering valves, the pressure valves each including: a first chamber; a second chamber; and a flexible member separating the first chamber from the second chamber, said flexible member serving to vary the flow passage section of its pressure valve, said pressure valves being arranged so that the pressure of the fuel downstream of the metering valves is communicated to the first chambers of the pressure valves which tends to urge the flexible member of the respective pressure valve in an opening direction and so that the first chamber of the differential pressure control valve communicates with the second chambers of the constant pressure valves, the improvement comprising:

a. a first throttle; and

b. a control pressure circuit including the second chamber of the differential pressure control valve, a magnetic valve, a storage element and a second throttle wherein:

i. the first throttle is disposed between the fuel supply line and the control pressure circuit;

ii. the first chamber of the differential pressure control valve is disposed downstream of the first throttle; and

iii. the pressure difference across the metering valves may be varied by varying the pressure difference across the first throttle by means of the magnetic valve via the storage element and the second throttle.

3,946,715

CENTRIFUGAL RPM GOVERNOR FOR FUEL INJECTED INTERNAL COMBUSTION ENGINES

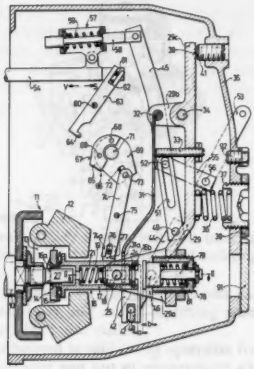
Heinrich Staudt, Markgroningen-Talhausen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Mar. 5, 1974, Ser. No. 448,202

Claims priority, application Germany, Mar. 6, 1973, 2311044

Int. Cl.² F02D 1/04

U.S. Cl. 123—140 R 3 Claims



1. In a centrifugal rpm regulator for fuel injection regulation for fuel injected internal combustion engines, especially diesel engines, including a housing mounting; centrifugal weight means, an adapter sleeve slidably displaceable under the influence of the centrifugal weight means as a function of engine rpm and in opposition to the force of an idling control spring and a maximum rpm control spring, at least one two-armed intermediate lever, an operating arm, a fuel quantity control member, the adapter sleeve transmitting the forces associated with its controlled motions resulting from its slidable displacement through the intermediate lever to the fuel quantity control member for adjusting the fuel quantity delivered by an injection pump used in conjunction with the governor, the intermediate lever having a pivot point which is changeable in dependence on the pivotal position of the operating lever, the movement of the control member being limited in the direction of increasing fuel supply by an adjustable stop means having a cam plate which determines the maximum fuel supply quantity, at least one control arm which couples the stop means with the adapter sleeve thus rendering the position of the cam plate adjustable in dependence on engine rpm, the adapter sleeve including a transmission member and a setting member forming two coaxially disposed portions and an intermediate spring therebetween which biases the transmission member and the setting member toward an initial position which they can assume, the transmission member being coupled to the stop means by the control arm and the setting member being coupled to the intermediate lever by connecting means, an energy storing mechanism mounted between the control member and the intermediate lever, the energy storing mechanism including a spring which is tensioned when the intermediate lever moves the control member beyond the stop means, and stroke limiting means which is effected by the force of the maximum rpm control spring, such that the setting member moves against the idling control spring during the idling stroke of the governor and engages the stroke limiting means at the completion of the idling stroke, the improvement comprising:

a. a support lever;

b. means pivotably mounting said support lever to the housing; and

c. a support lever stop mounted to the housing, wherein,

the maximum rpm control spring biases one end of the support lever against the support lever stop,

the support lever has a yieldable adapter stop means mounted at its other end to be coaxial with the adapter sleeve, the adapter stop means including an adaptation spring and an abutment surface against which the transmission member abuts at the end of the idling stroke of the governor,

the support lever has an adjustable counter bearing mounted between its two ends to extend in a direction parallel with respect to the axis of the adapter sleeve for engaging the idling control spring,

the pretension force of the intermediate spring is greater than the maximum force of the idling control spring, and

the pretension force of the intermediate spring and its spring stiffness are smaller than the pretension force and spring stiffness of the adaptation spring.

3,946,716

RPM REGULATOR FOR FUEL INJECTION PUMPS

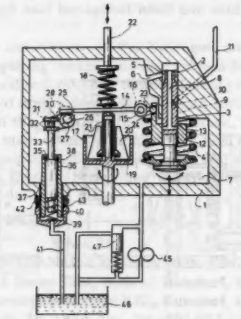
Karl Konrath, Ludwigsburg, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Aug. 20, 1974, Ser. No. 499,058

Claims priority, application Germany, Aug. 21, 1973, 2342107

Int. Cl.² F02D 1/04

U.S. Cl. 123—140 A 7 Claims



1. In an rpm regulator for use with a fuel injection pump associated with an internal combustion engine, said regulator including a housing, rpm-dependent means, an intermediate lever, regulator spring means connected to said intermediate lever, said rpm-dependent means engaging one arm of said intermediate lever in opposition to the force of said regulator spring means causing said intermediate lever to be thereby adjusted, rpm-responsive stop means for limiting the motion of said intermediate lever, and means for supplying regulator fluid to the housing, wherein the pressure of the regulator fluid is rpm-dependent, and wherein the regulator fluid serves to interact with said rpm-responsive stop means, the improvement comprising:

a cam, affixed adjustably to said housing and engageable with said intermediate lever;

a crank, connected to said cam;

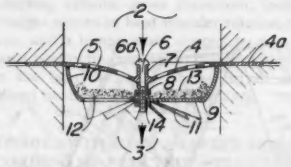
a plunger, slidably disposed with respect to said housing and connected to said crank; and

a spring mounted so as to exert a force against said plunger, whereby the regulator fluid acts on said plunger in opposition to said spring, causing said plunger to turn said crank and thereby rotate said cam.

3,946,717
FUEL VAPORIZER WITH CENTRIFUGAL-VENTURI LIQUID DROPLET FEEDBACK

Will Clarke England, 7310 Eastcrest Drive, Austin, Tex. 78752

Filed Apr. 14, 1975, Ser. No. 567,781
Int. Cl.² F02M *29/00;* **B01F** *3/02*
U.S. Cl. 123—141 **10 Claims**



1. A centrifugal-venturi liquid droplet feedback fuel vaporizer inserted in the passage of fuel and air flow between the place of fuel mist introduction and a combustion chamber intake comprising:

A. a sieve mounted across the flow passage with a protuberant center extending in the direction of flow whereby the air and fuel vapor would accelerate through said seive openings and the slower liquid fuel droplets would tend to impact on said sieve face and flow toward the protuberant center because of differential flow characteristics;

B. a spindle bearing mounted securely in the protuberant center of said sieve;

C. a spindle rotatably installed in said spindle bearing, the axis of rotation corresponding to the direction of flow, and said spindle secured in said spindle bearing against movement along the axis of rotation;

D. a circular bowl with a rim nearly touching the backside of said sieve, and said rim outside of said sieve openings mounted securely to said spindle in the center of the bottom of said bowl after said sieve in the direction of flow with said bowl being free to rotate symetrically with said spindle;

1. the bottom of said bowl having openings allowing the accelerated flow through said openings of the air and fuel vapor with said slower liquid fuel droplets again tending to impact on the bowl bottom due to the rotation of bowl bottom openings at right angles to the general direction of air and fuel vapor flow, with said impacted liquid fuel centrifugally spun outward in said bowl;

2. the circular sides of said bowl directing the outward liquid flow back to the outer perimeter of the back side of said sieve, there again to flow toward the protuberant center of said sieve because of differential pressure; and

E. an axial impeller centrally secured to said spindle and rotatable therewith, said impeller rotatably responsive to said air and fuel flow, thus rotating said circular bowl.

3,946,718
QUICK-DETACHABLE ARCHERY QUIVER

Burdette Mallory Garman, 3142 Wiltshire Drive, Avondale Estates, Ga. 30002

Filed Aug. 28, 1972, Ser. No. 284,408
Int. Cl.² F41B *5/06*
U.S. Cl. 124—30 R **4 Claims**

1. A quick-detachable arrow quiver adapted to be attached to the upper and lower limbs of a conventional archery bow, said quiver comprising

a single elongated substantially vertical support bar,

an upper arrow holder stationarily secured adjacent an edge thereof to the upper portion of said support bar,

a lower arrow holder stationarily secured adjacent an edge thereof to the lower portion of said support bar in vertically-spaced relationship to said upper arrow holder,

said lower arrow holder having arrow grippers spaced apart from one another around the entire periphery thereof for releasably gripping a plurality of arrows,

and upper and lower L-shaped angle brackets of vertically-elongated cross-section having inner arms secured to said upper and lower portions of said support bar in vertically-spaced relationship thereon and having outer arms adapted to abuttingly engage respectively the rearward faces of the upper and lower limbs of the bow.

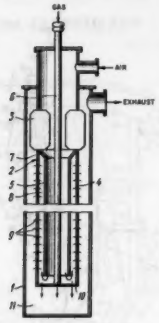
3,946,719
RADIANT GAS HEATER

Semen Efimovich Bark, Profsojuznaya ulitsa, 32/10, kv. 142; Ivan Semenovich Garkusha, B. Serpukhovskaya ulitsa, 31, korpus 5, kv. 166-b; Jury Pavlovich Kafyrin, Klenovy bulvar, 22, kv. 29; Efim Vulfovich Kreinin, Starye Kuzminki, kvartal 127a, 9-b, kv. 69; Nikolai Ananievich Fedorov, B.Serpukhovskaya ulitsa, 31, korpus 5, kv. 198-b, all of Moscow; Vladimir Fedorovich Shulyak, ulitsa Sovetskaya, 24, kv. 43, Balashikha Moskovsk... oblasti; Alexandr Alexandrovich Khaitin, Sumskoi proezd, 5, korpus 1, kv. 205, Moscow; Sergei Gavrilovich Alexandrov, ulitsa K.Marxa, 52, kv. 20; Marat Mikhailovich Bobrov, ulitsa Volodarskogo, 84, kv. 46, both of Kamensk-Shakhtinsky Rostovskoi oblasti; Vyacheslav Grigorievich Goman, prospekt Lenina, 6, kv. 18, Kuibyshev; Viktor Sergeevich Ermolaev, Rublevskoe shosse, 83, korpus 2, kv. 13; Sergei Vladimirovich Leonov, Yartsevskaya ulitsa, 34, korpus 2, kv. 36, both of Moscow, and Vikenty Pavlovich Mikheev, ulitsa Nevskaya, 5, kv. 15, Kuibyshev, all of U.S.S.R.

Filed July 31, 1974, Ser. No. 493,729
Int. Cl.² F24C *3/00*
U.S. Cl. 126—91 A **4 Claims**

1. A radiant gas heater comprising coaxially arranged elements — an external heating heat-radiating shell having a bottom at one end thereof; an air-conducting tube inside said shell, the inner end of said air-conducting tube extending into said radiating shell, and being provided with a bottom somewhat spaced from the bottom of said external heat radiating shell and another top end, protruding outwardly from said external heat-radiating shell, which is open for supplying an air flow through said air-conducting tube, a combustion chamber formed inbetween said external heat-radiating shell and said air-conducting tube, said air-conducting tube having perforations in the side walls and the bottom thereof to let air pass into said combustion chamber; a central gas tube disposed within said air-conducting tube for supplying gas fuel into said combustion chamber; an intermediate tubular partition disposed in the air-conducting tube coaxially therewith between the perforated sidewall portion of said air-conducting

tube and the central gas tube, said tubular partition having one end open and spaced somewhat apart from the bottom portion of said air-conducting tube to permit the air flow from the inner space of the tubular partition to said perforated side wall portion, the other end of said tubular partition being open to



deliver therein the initial air flow into the inner space of said tubular partition and being tightly attached to said air-conducting tube to divide the space within said tube into two separate annular passages for the flow of air and a recuperator disposed at the portion of said air-conducting tube in the zone of output of exhaust gases from said combustion chamber.

3,946,720

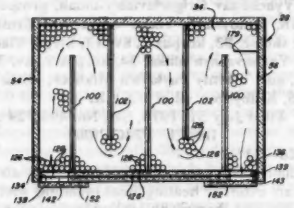
SOLAR HEAT COLLECTOR

John Harold Keyes; Charles Irvin Strickland, and Robert George Strickland, all of Nederland, Colo., assignors to International Solarthermics Corporation, Nederland, Colo.

Division of Ser. No. 445,473, Feb. 25, 1974. This application Oct. 16, 1974, Ser. No. 515,230

Int. Cl.[2] E24J *3/02*

U.S. Cl. 126—270 **9 Claims**



1. A solar heat collector unit comprising:

a heat conductive back plate,

a plurality of heat conductive partitions protruding away from one face of said back plate, said partitions being of cup-shaped configuration with the longitudinal axes of the cups extending perpendicularly to the back plate, and

a transparent sheet sealed in spaced relationship from said back plate through which solar heat can pass to be absorbed by the plate and partitions, said transparent sheet and back plate defining a passage therebetween through which fluid may pass and absorb heat from the back plate and partitions.

3,946,721

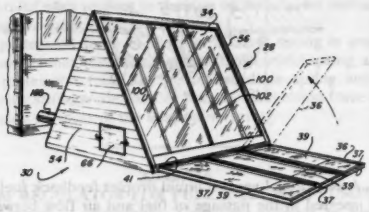
METHOD OF COLLECTING AND STORING SOLAR HEAT

John Harold Keyes; Charles Irvin Strickland, and Robert George Strickland, all of Nederland, Colo., assignors to International Solarthermics Corporation, Nederland, Colo.

Division of Ser. No. 445,473, Feb. 25, 1974. This application Oct. 16, 1974, Ser. No. 515,234

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—270 **3 Claims**



1. A method of collecting and storing solar heat comprising the steps of:

absorbing the heat on a collector surface wherein said collector surface is insulated from the ambient environment,

passing air across the collector surface in a heat transfer process whereby the heat absorbed by the collector surface is transferred to the air,

passing the hot air leaving the collector surface through a horizontal duct disposed at a lower elevation than the collector surface,

passing the hot air emanating from said duct into an elevated storage chamber wherein said storage chamber has material with heat absorbent and heat retaining characteristics so that heat in the hot air is transferred from the hot air to said material and retained by said material, and

passing air from said storage chamber through a second horizontal duct which is at a lower elevation than said collector surface and storage chamber, and directing the air emanating from said second duct across the collector surface to establish a circulating air current across said collector surface and through said storage chamber.

3,946,722

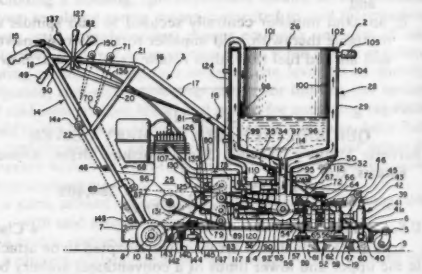
AMBULATORY TAR APPLICATOR

Robert J. Banahan, 3949 N. Olcott Ave., Chicago, Ill. 60634

Filed Dec. 7, 1973, Ser. No. 422,741

Int. Cl.[2] E01C *19/45*; **F24H** *1/06, 1/46*

U.S. Cl. 126—343.5 A **6 Claims**



1. In a mobile roof tarring device, storage means for containing a quantity of molten tar compound, and combined unitary means for:

a. heating the compound in said storage means to melt the same and for maintaining the compound in a fluid state and for

b. agitating the compound for maintaining the same in said fluid state and for enhancing the flow of said compound from the hopper and through associated distributing means, and

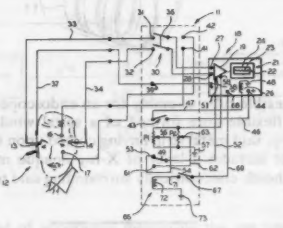
said means for heating and agitating the compound comprising an internal combustion engine and means for conducting exhaust gases therefrom, including a heat exchanger means in heat transfer relation to the storage means, and a temperature control by-pass valve in said exhaust conducting means for diverting the exhaust gases from the heat exchanger means to an area providing localized heating of the storage means.

3,946,723

ELECTRODE SWITCHING ADAPTER FOR VERTICAL RECORDING OF ELECTRONYSTAGMOGRAPHS

Gerald H. Servos, Glen Ellyn, Ill., assignor to Instrumentation & Control Systems, Inc., Addison, Ill.

Filed Dec. 5, 1974, Ser. No. 529,808
Int. Cl.² A61B 5/05
U.S. Cl. 128—2.1 M **8 Claims**



1. An electronystagmographic testing system for testing and recording nystagmus,

said electronystagmographic system comprising a first pair of electrodes attachable to a patient to detect signals responsive to the horizontal movement of the patient's eye,

a second pair of electrodes attachable to the patient to detect the vertical movement of the patient's eye,

single channel recording means for providing a trace indicating the eye movements of the patient,

input terminals on said recording means,

said trace being responsive to said detected signals received at the said input terminals,

an electrode switching adapter for selectively recording vertical eye movements or horizontal eye movements on said single channel recording means,

said electrode switching adapter comprising first switching means for selectively attaching either said first or said second pair of electrodes to the input terminals of said recording means,

said first switching means having first pole means attached to said first pair of electrodes and second pole means attached to said second pair of electrodes,

armature means on said first switching means for connecting to said first pole means or said second pole means and attached to the input terminals of said single channel recording means, whereby said single channel recording means records either the horizontal or the vertical movement of the eye depending on whether the armature means is connected to said first pole means or said second pole means, respectively,

said single channel recording means including amplifier means, for amplifying the detected signals to provide said trace,

means for coupling said input terminals to the input of said amplifier means, and

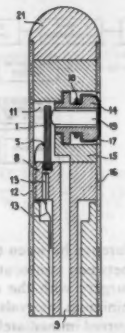
amplifier gain varying means in said switching adapter for automatically varying the gain of the amplifier means depending on whether the horizontal or vertical eye movements are being recorded.

3,946,724

DEVICE FOR MEASURING PRESSURE

Maurice La Balme, Saint Cloud, France, assignor to Thomson Medical-Telco, Paris, France

Filed Apr. 1, 1974, Ser. No. 456,475
Claims priority, application France, Apr. 9, 1973, 73.12666
Int. Cl.² A61B 5/02
U.S. Cl. 128—2.05 E **6 Claims**



1. A device for measuring pressure of a medium comprising: a chip of semiconducting material whereon an integrated circuit including at least one field effect transistor sensitive to deformation is formed; means for defining a chamber housing said chip and impervious to said medium the pressure of which is to be measured relatively to that within said chamber, said chamber defining means including: a casing, a fixed support integrally secured to said casing and fixedly carrying one end of said chip, a mandrel-shaped hollow guide member having a central opening and one end tightly secured to said casing so as to locate one end of said central opening adjacent the other, free end of said chip, and a resilient membrane stretched across and secured to the other end of said hollow guide member for imperviously covering the other end of said central opening; and a rod-shaped core freely movably inserted inside said central opening having ends respectively in unattached contact with said membrane and said other, free end of said chip for transmitting the deformations of said membrane under pressure to said chip by axial displacements of said core.

3,946,725

METHOD FOR CONTROLLING THE LEVEL OF ANAESTHESIA IN SURGERY AND APPARATUS FOR EFFECTING SAME

Vladimir Mikhailovich Bolshov; ulitsa akademika Pablova, 5/2, Kv. 44, Moscow; Vyacheslav Evgenievich Volnov, Kirovogradskaya ulitsa, 42, Korpus 1, Kv. 500, Moscow; Solomon Zalmanovich Kletskin, Moskovskaya oblast, ulitsa Karpovskaya, 45/2, Kv. 12, Pavlovsky Posad; Viktor Julievich Ostrovsky, Proletarsky prospekt, 7, Kv. 76, Moscow; Valery Vladimirovich Soloviev, ulitsa Oleko Dundicha, 29. Kv. 39, Moscow; Nina Yakovlevna Ter-Kasparova, Moskovskoi oblasti, Moskovskoe shosse, 41, Kv. 76, Dolgoprudny, all of U.S.S.R.

Filed Mar. 26, 1974, Ser. No. 454,797
Int. Cl.² A61B 5/04
U.S. Cl. 128—2.06 R **4 Claims**

1. A method for providing an optimum level of anaesthesia during surgery comprising:

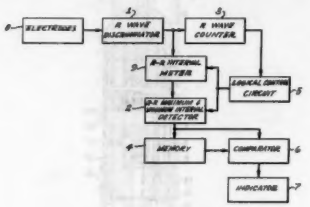
measuring immediately prior to surgery the maximum interval and the minimum interval between consecutive R waves which occur during a predetermined number of

heart contractions of an anaesthetized patient on which surgery is to be performed;

calculating the difference between the maximum interval and the minimum interval between consecutive R waves which occurred immediately prior to surgery;

measuring during the course of surgery the maximum interval and the minimum interval between consecutive R waves which occur during said predetermined number of heart contractions;

calculating the difference between the maximum interval and the minimum interval between consecutive R waves which occurred during the course of surgery;



comparing the difference between the maximum and minimum intervals between consecutive R waves which occurred during surgery with the difference between the maximum and minimum intervals between consecutive R waves which occurred immediately prior to surgery; and

administering anaesthetic to the patient to minimize a difference between the difference between the maximum interval and minimum interval between consecutive R waves which occurred during surgery and the difference between the maximum interval and minimum interval between consecutive R waves which occurred immediately prior to surgery.

3,946,726

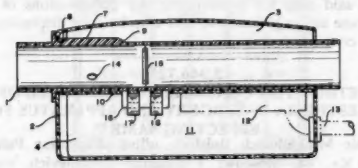
PULMONARY DIAGNOSTIC INSTRUMENT INCLUDING BREATH TRANSDUCER

Richard E. Pikul, De Soto, Mo., assignor to Puriton-Bennett Corporation, St. Louis, Mo.

Filed Aug. 7, 1974, Ser. No. 495,329

Int. Cl.² A61B *5/08*

U.S. Cl. 128—2.08 **19 Claims**



1. A diagnostic instrument for use in detecting lung disfunction through specimen breathing and comprising a flow tube means adaptable for accommodating the flow of specimen breath therethrough, a resiliently mounted diaphragm means disposed within said tube means and subject to complete and uniform lineal displacement due to the force of the moving breath thereby, said diaphragm means comprising a plate means, said plate means having at least one aperture provided therethrough for allowing the obstructed passage of the breath there past, at least one conductive ring, said ring being secured to a side of the apertured plate means, said ring being mounted around the periphery of said apertured plate means, suspension means supporting the apertured plate means and ring within the flow tube means, said suspension means providing for peripheral mounting of said plate means within said flow tube means, said suspension means comprising a series of arcuate arms each having one end connected to and extending from the periphery of said plate means, the other end of each said arcuate arms secured within the flow tube means, said arcuate arms having sufficient resiliency to provide for the uniform lineal displacement of the full apertured plate means and ring within the flow tube means during passage of the specimen breath therethrough, and means cooperating with said flow tube means for detecting the degree of said lineal displacement of the ring for providing representative information pertaining to pulmonary functioning for specimen diagnosis.

3,946,727

FLEXIBLE TUBE ASSEMBLY FOR AN ENDOSCOPE

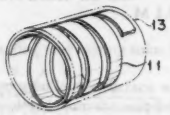
Takeshi Okada, and Katsuyuki Kanehira, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed July 11, 1972, Ser. No. 270,627

Claims priority, application Japan, June 15, 1971, 46-62736

Int. Cl.² A61B *1/06*

U.S. Cl. 128—4 **1 Claim**



1. A flexible tube assembly for an endoscope comprising a tubular, flexible core formed of a spiral winding of elastic metal strip, said metal strip having coated upon both the inner and outer surfaces a layer of X-ray opaque material and a flexible sheath concentrically surrounding said tubular core in close fit.

3,946,728

SURGICAL DEVICE

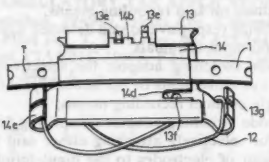
Marcel Bettex, Bern, Switzerland, assignor to Protek A.G., Switzerland

Filed May 24, 1974, Ser. No. 473,238

Claims priority, application Switzerland, May 15, 1974, 7633/74; June 17, 1974, 6626/74

Int. Cl.² A61F *5/00*

U.S. Cl. 128—69 **6 Claims**



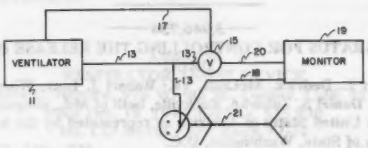
1. A device for use in the surgical treatment of a patient suffering from a funnel breast condition, the device comprising in combination: two mutually symmetrical clamping members each having an end portion adapted to be secured to a respective rib of such a patient; fastening means releasably rigidly connecting to one another the respective other end portions of said two clamping members; and a fastening element releasably engaging with said fastening means and adapted to attach the latter to the breast bone of such a patient; each clamping member comprising an elongate strip, one surface of said strip being provided with a plurality of depressions equally spaced in the longitudinal direction of the strip and the respective other surface of said strip being provided with a plurality of protrusions complementary with said depressions, said depressions and protrusions provided on said

two clamping members being of identical shape; said fastening means comprising a base plate and a cover plate releasably connected to said base plate, said base plate defining a guide groove adapted to receive at least one of said clamping members, a portion of said base plate defining the floor of said groove being provided with a plurality of depressions which, upon said cover plate being connected to said base plate to close said fastening means, engage with said protrusions on a respective one of said clamping members disposed next adjacent said floor of said guide groove, said depressions on said one clamping member being engaged by said protrusions on the respective other said clamping member, which is being retained in engagement with said one clamping member by said cover plate.

3,946,729
VENTILATOR PATIENT MONITOR

Kim L. Hanna, Acton, Mass., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 17, 1974, Ser. No. 515,801
Int. Cl.² A61M *16/00*
U.S. Cl. 128—145.8 **13 Claims**



1. A method of accurately measuring the gas volume expired by a patient through an expiration valve of a ventilator-patient system, the method comprising the steps of:

a. monitoring any flow of gas through said expiration valve during the inspiration and expiration phase received by a ventilation-monitor and generating a gas volume signal indicative of the gas flow received by said ventilator monitor;

b. developing an accurate expiration signal from the ventilator-patient system that defines the time period when the patient is expiring gas from his lungs; and

c. gating said gas volume signal to a gas volume accumulation register of said ventilator monitor only during the presence of said accurate expiration signal to eliminate from said gas volume signal the monitored gas flow through a leaking expiration valve during inspiration of the patient.

3,946,730
BIOMEDICAL ELECTRODE ASSEMBLY

Robert Paul Monter, Centerville, Ohio, assignor to NDM Corporation, Dayton, Ohio

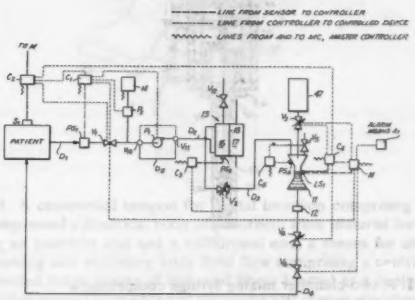
Filed Jan. 21, 1972, Ser. No. 219,686
Int. Cl.³ A61B *5/04*
U.S. Cl. 128—2.06 E **12 Claims**

1. In an electrode/electrolyte assembly for use in sensing the bioelectrical potentials of a living animal body and having means defining a cavity opening to the body and an electrode member at the base of the cavity and projecting therethrough, an electrolyte substantially filling said cavity and in direct contact with said electrode, and said electrode being adapted to be electrically connected to an external electrically responsive member, the improvement wherein the electrode is stainless steel and the electrolyte in said cavity means is an alkali metal surface.

3,946,731
APPARATUS FOR EXTRACORPOREAL TREATMENT OF BLOOD

Eric S. Lichtenstein, 420 Taconic Road, Greenwich, Conn. 06830

Continuation-in-part of Ser. No. 395,214, Sept. 7, 1973, Pat. No. 3,912,455, which is a continuation-in-part of Ser. Nos. 108,118, Jan. 20, 1971, Pat. No. 3,774,762, and Ser. No. 157,942, June 29, 1971, abandoned. This application July 31, 1974, Ser. No. 494,006
Int. Cl.² A61M *1/03*
U.S. Cl. 128—214 R **29 Claims**

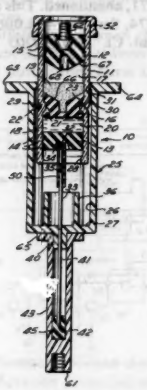

LINE FROM SENSOR TO CONTROLLER
LINE FROM CONTROLLER TO CONTROLLED DEVICE
LINES FROM AND TO MC, MASTER CONTROLLER
PATIENT

1. An improved apparatus for receiving blood or other fluid and physiological samples and carrying out diagnostic tests on said blood, fluid and samples, for automated therapeutic infusion, and being particularly suited for automated extracorporeal treatment of blood from a plurality of patients either in sequence or with a plurality of units simultaneously, said apparatus including in spatial sequence blood-taking means for taking blood from a patient, a blood treatment chamber for treating said blood, said treatment including oxygenation and dialysis, and blood returning means, said improvement comprising first sensor, signalling and controller means for holding the rate of taking blood from said patient within programmable limits, second sensor, signalling and controller means for controlling the pressure of said taken blood in said apparatus within programmable limits, third sensor, signalling and master controller means for monitoring the cardiovascular status of the patient, said master controller means being operatively connected to said first and second controller means for adjusting said programmable limits of same to hold said cardiovascular status within limits appropriate to the condition of said patient and the stage and progress of said treatment, and monitor means operatively connected to said first, second and third controller means for detecting divergence of any of said rate of taking of blood, pressure of blood in said apparatus and cardiovascular status of said patient beyond programmed limits for a period of time longer than a preselected period, said monitor means being programmed to shut down said apparatus on detection of such a divergence for said longer than preselected period thereby making said apparatus fail-safe, and making said monitor a fail-safe monitor, the information received by said master controller means from said third sensor means and from said first and second sensor means constituting a system in which said signals from said patient take precedence for shutting down said apparatus even when said first and second sensor means indicate that said apparatus is functioning with programmed limits, thereby establishing the safety and well-being of the patient as the dominating variable.

3,946,732
TWO-CHAMBER MIXING SYRINGE

Alfred A. Hurscham, Hudson, Ohio, assignor to Ampoules, Inc., Macedonia, Ohio

Continuation-in-part of Ser. No. 386,594, Aug. 8, 1973, abandoned. This application July 18, 1974, Ser. No. 489,746
Int. Cl.² A61M 5/00
U.S. Cl. 128—218 M 25 Claims



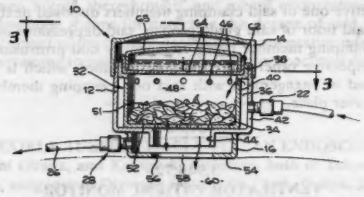
1. A two-chamber mixing syringe comprising:
a. vial means;
b. a plunger slidable within and closing one end of the vial means;
c. an end diaphragm closing the other end of the vial means;
d. a stationary intermediate diaphragm within said vial means separating the interior of the vial means into first and second chambers respectively defined by said plunger and intermediate diaphragm and by said intermediate diaphragm and said end diaphragm; said vial means and intermediate diaphragm having coacting parts that comprise means for locking the intermediate diaphragm against axial movement towards said plunger during a mixing operation and during a dispensing operation; said coacting parts comprising radially extending interengaging and interfering surfaces on said vial means and said intermediate diaphragm;
e. a cup-shaped holder having a cylindrical bore closed at one end and receiving said other end of said vial means with said other end of said vial means spaced from said closed end of said bore; and
f. hollow needle means having a pointed end within the space between said other end of said vial means and said closed end of said bore, whereby an ingredient in said first chamber may be mixed with an ingredient in said second chamber by applying axial pressure to said vial means so that said needle sequentially pierces said end diaphragm and said intermediate diaphragm and whereby said ingredients may be dispersed by advancing said plunger toward said intermediate diaphragm.

3,946,733
MOXIBUSTION APPARATUS

Jin Suk Han, 4810 Westminster Ave., Santa Ana, Calif. 92703

Filed Jan. 13, 1975, Ser. No. 540,333
Int. Cl.² A61B 17/36
U.S. Cl. 128—254 7 Claims

1. Apparatus for treatment of a user by periodic localized topical application of therapeutic combustion gases, said apparatus comprising a first chamber communicating with a blower pressurized air supply, a second chamber within said first chamber and defining an annular pressurized air supply plenum therewith, said second chamber comprising a combustion chamber having a grating adapted to support for combustion therapeutic gas-producing combustible material comprising herbs or the like, a third chamber beyond said combustion chamber grating and adapted to contain combustion gases generated within the combustion chamber, said third chamber having an opening for application of said gases to the user's skin, port means communicating said plenum with the interior



of said combustion chamber for passage of pressurized air into the combustion chamber and for combustion of said combustible material, said pressurized air acting to differentially pressurize the combustion chamber to urge gaseous combustion products through said grating to said third chamber opening, and reduced gas outlet means in said third chamber to back-pressurize said third chamber during treatment periods.

3,946,734
APPARATUS FOR CONTROLLING THE RELEASE OF A DRUG

Robert L. Dedrick, McLean, Va.; Robert J. Lutz, Wheaton, and Daniel S. Zaharko, Rockville, both of Md., assignors to The United States of America as represented by the Secretary of State, Washington, D.C.

Filed Feb. 19, 1975, Ser. No. 551,120
Int. Cl.² A61M 5/00, 7/00, 31/00
U.S. Cl. 128—260 7 Claims

1. A diffusion cell comprising a hollow small diameter capillary tube containing therein a biologically active substance adjacent one end, said one end thereof being sealed with an inert impervious material and the rest of the tube and the other end thereof closed with a neutral hydrophilic polymeric material.

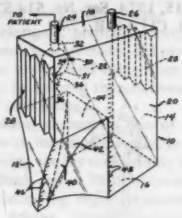
3,946,735
MEDICAL DRAINAGE DEVICE

Richard A. DeWall, 421 Thornhill Road, Dayton, Ohio 45419

Filed May 13, 1974, Ser. No. 469,423
Int. Cl.² A61M 1/00
U.S. Cl. 128—278 10 Claims

1. A surgical suction device comprising: an enlarged container having an inlet for fluids and and outlet for fluids, said container being formed of a resilient material of a type tending to restore itself to an original shape following a distortion thereof from said original shape, said inlet being adapted to be connected to apparatus for insertion into an area of a patient to be drained; a check valve associated with said inlet for allowing fluid to pass into said container through said inlet while precluding substantial backflow of fluid from said container through said inlet; and means formed in at least a portion of said container facilitating compression of the same to reduce the volume therein said check valve associated with said inlet being located interiorly of said container and including a chamber formed of compressible material in fluid com-

munication with said inlet and having a valve establishing fluid communication between the interior of said chamber and the interior of said container, said chamber having a relatively small volume compared to the volume of said container



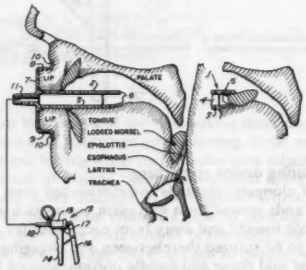
whereby compression of said container will cause partial collapse of said chamber to drive fluid contained therein backwardly through said inlet to provide a milking action assisting fluid in a conduit connected to said inlet to migrate to said container.

3,946,736

RESPIRATOR ASSIST DEVICE

Theodore C. Neward, 976 W. 9th St., Upland, Calif. 91786

Filed Oct. 18, 1974, Ser. No. 515,830
Int. Cl.² A61M *1/00*; A61B *17/24*
U.S. Cl. 128—278 **4 Claims**



1. A respirator assist device for removal of an object lodged in the throat, said device comprising:

a. a mouth covering plate having a marginal flange dimensioned to encase and seal the lips of the user;

b. a pair of flat blade elements extending from the mouth covering plate;

c. a pair of wall elements extending from the covering plate and joined to the balde elements to form a passageway;

d. the blade elements being insertable between the palate and the tongue of the user to depress the tongue from the palate, the covering plate limiting the depth of insertion of the blade elements to prevent contact with the back of the mouth and throat;

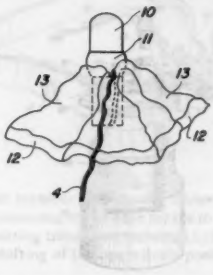
e. and means communicating with the passageway through the mouth covering plate for producing a negative pressure in the passageway thereby to produce a pressure differential across an object lodged in the throat and urge the object toward the blade elements.

3,946,737

CATAMENIAL TAMPON

Paul Kobler, Lynbrook, N.Y., assignor to Paul Kobler, Lynbrook, N.Y.

Filed July 5, 1974, Ser. No. 466,180
Claims priority, application Switzerland, May 25, 1973, 7492/73
Int. Cl.² A61F *13/20*
U.S. Cl. 128—285 **4 Claims**



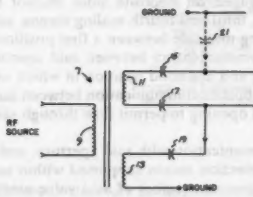
1. A catamenial tampon for digital insertion comprising a compressed cylindrical body of absorbent fibre material having an insertion end and a withdrawal end, a means for obstructing and absorbing body fluid flow comprising a central rounded bulge means of loosened fibres located at a central portion spaced from ends and defining a soft porous absorbent section for contacting the vaginal walls.

3,946,738

LEAKAGE CURRENT CANCELLING CIRCUIT FOR USE WITH ELECTROSURGICAL INSTRUMENT

David W. Newton, 4523 Canterbury, Boulder, Colo. 80304, and John M. Adan, 3300 Martin Drive, Boulder, Colo. 80303

Filed Oct. 24, 1974, Ser. No. 517,492
Int. Cl.² A61B *17/36*; A61N *3/00*
U.S. Cl. 128—303.14 **8 Claims**



1. The combination comprising:

an electrosurgical instrument having an active electrode and a patient electrode;

a power transformer having an isolated output circuit connected to said active and patient electrodes for supplying current thereto;

means for supplying power to said power transformer; and,

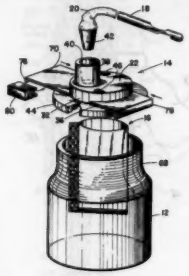
a leakage current cancelling circuit for use in cancelling leakage current at said isolated output circuit, said cancelling circuit comprising means for offsetting leakage current caused by stray capacitance to ground at said output circuit, said offsetting means including inductive and capacitive elements connected with one side of said output circuit and ground and having values selected to accomplish said leakage current cancellation.

3,946,739

SELF-CONTAINED VACUUM ASPIRATOR

Richard M. Berman, Dresher, Pa., and Bernard Schwartz, Springfield, N.J., assignors to Alphamedics Mfg. Co., Levittown, Pa.

Division of Ser. No. 399,535, Sept. 21, 1973. This application June 30, 1975, Ser. No. 591,507
Int. Cl.[2] A61B 17/22; A61M 1/00
U.S. Cl. 128—304 3 Claims



1. A self-contained vacuum aspirator system comprising

a container having a vacuum applied therein;

a valve assembly secured to said container for selectively allowing the passage of fluid into said container; said valve assembly comprising

a first member having an aperture therethrough, said first member having a first surface on which is positioned first sealing means surrounding said aperture and second sealing means surrounding said first sealing means;

a second member secured to said first member, said second member having an opening therethrough and a first surface on which is positioned third sealing means surrounding said opening and fourth sealing means surrounding said third sealing means; and

a slide member having a passageway therethrough, said slide member being movably mounted between said first surfaces of said first and second members and sealingly engaged on opposite sides thereof by said first, second, third and fourth sealing means, said slide member being movable between a first position which interrupts communication between said aperture and said opening and a second position in which said passageway establishes communication between said aperture and said opening to permit flow through said valve assembly,

a curette in communication with said aperture; and

air permeable collection means supported within said container by said second member of said valve assembly in communication with said opening for accumulating matter collected by said curette when said slide member is moved to its second position;

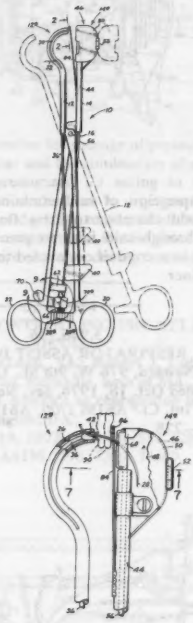
wherein first and second sealing means comprise first and second sealing members received in channels provided in said first surface of said first member, and said third and fourth sealing means comprises thrid and fourth sealing members received in channels provided in said first surface of said second member; and wherein a portion of said second sealing member is spaced from a corresponding portion of said first sealing member by a distance greater than the diameter of said passageway through said slide member, and a portion of said fourth sealing member is spaced from a corresponding portion of said third sealing member by a distance greater than the diameter of said passageway, said passageway through said slide member being sealingly located between said respective portions of said first, second, third and fourth sealing members when said slide member is located in its said first position.

3,946,740

SUTURING DEVICE

John W. Bassett, 2231 Lloyd Center, Portland, Oreg. 97232

Filed Oct. 15, 1974, Ser. No. 514,578
Int. Cl.[2] A61B 17/04
U.S. Cl. 128—334 R 14 Claims



1. A suturing device comprising

a pair of elongate, pivotally interconnected arms having a set of ends spaced from said pivot connection which are movable toward and away from each other for receiving tissue to be sutured therebetween and engaging opposite sides of said tissue and handle portions spaced from said ends for gripping by a user,

needle holding means on one of said arms for holding a needle with its point directed toward the other arm,

needle driving means on said one arm for driving said needle through tissue held between said arms and into a needle receiving region adjacent said other arm,

needle receiving means on said other arm in said needle receiving region,

holding means on said other arm for selectively engaging and holding a needle received in said needle receiving means, including a holding element mounted for selective shifting between a released position permitting free movement of a needle into and out of said needle receiving means and a holding position in which said needle is held in said receiving means to accommodate drawing the same through tissue on movement of said arms away from each other, and

an operator member mounted for rotational movement adjacent one of said handle portions and operatively connected to said holding element whereby rotating of said operator member between a released position and a

holding position produces shifting of said holding element between its released and holding positions, and biasing means operatively connected to said operator member for yieldably urging said operator member and holding member toward their holding positions following initial displacement of said operator member from its released position.

9. A suturing device comprising

a pair of elongate, pivotally interconnected arms having a set of ends spaced from said pivot connection which are movable toward and away from each other for receiving tissue to be sutured therebetween and engaging opposite sides of said tissue,

needle holding means on one of said arms for holding a needle with its point directed toward the other arm,

needle driving means on said one arm for driving said needle through tissue held between said arms and into a needle receiving region ajdacent said other arm, said needle driving means including a driving member mounted for movement against the shank of a needle held in said needle holding means toward and away from said other arm and actuating means for moving said driving member between an extended needle driving position and a needle retracting position, and

needle gripping means on said driving means having opposed elements which open to receive a needle therein when said driving means is extended toward said other arm and which close on retraction of said driving member away from said other arm to grip said needle to retract the same into said needle holding means.

3,946,741

URETHRAL CATHETER AND BODY DRAINAGE DEVICE

Edwin L. Adair, 3535 S. Lafayette, Englewood, Colo. 80110

Filed Dec. 9, 1974, Ser. No. 530,840

Int. Cl.[2] A61B *17/34*

U.S. Cl. 128—347 **9 Claims**

1. In an instrument of the type having inner and outer relatively slideable telescopic tubes having distal ends secured together and having wings on the outer tube adjacent its distal end adapted to expand upon relative axial movement of the tubes, said tubes adapted to be disposed within the human body with their distal ends at a desired position therewithin and their proximate ends outside of the body, the tubes being subject to fluid leakage therebetween to outside of the instrument at the proximate end of the outer tube, the improvements, in combination, comprising:

a. sealing means disposed adjacent the proximate end of the outer tube for preventing said outward leakage, at least when the wings are in expanded position,

b. said means being so constructed to also lock the wings in expanded position.

3,946,742

ENDOTRACHEAL TUBE HOLDER

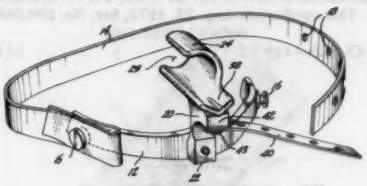
Bela Eross, P.O. Box 397, Bradfordwoods, Pa. 15015

Filed Oct. 18, 1974, Ser. No. 515,963

Int. Cl.[2] A61M *25/02, 16/00*

U.S. Cl. 128—351 **7 Claims**

1. An endotracheal tube holder comprising an endotracheal tube retainer member of elongated form adapted for operative positioning in a patient's mouth extending outwardly therefrom between the patient's teeth to serve as a bite protecting a tube retained therein against being clamped shut between the teeth, said retainer member being adapted to be shifted transversely of its length from side to side in the patient's mouth, and mounting means for the retainer member including base means formed to be seated against the patient's face adjacent to and extending along one lip, securing means engageable with the patient's head for holding the base means securely thus seated, and a support arm rigidly connected to



the retainer member in mutually transverse relationship and movably connected to the base means to be supported thereby while permitting transverse movement of the arm to effect the aforesaid shifting of the operatively positioned retainer member.

3,946,743

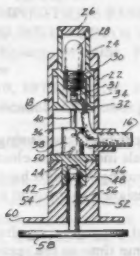
DEFIBRILLATING ELECTRODE

Dean L. Milani, Highland Park, and Richard G. Kerwin, Prospect Heights, both of Ill., assignors to Medical Research Laboratories, Inc., Park Ridge, Ill.

Filed Jan. 6, 1972, Ser. No. 215,727

Int. Cl.[2] A61N *1/04*

U.S. Cl. 128—404 **3 Claims**

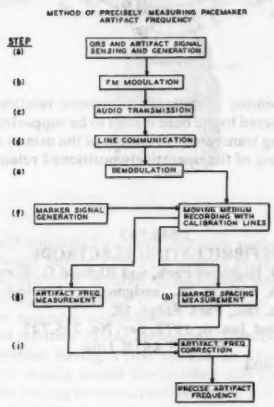


1. Electrode structure for application to a body of a patient comprising a handle adapted to be grasped in the hand of an operator, an electric contact on said handle to be pressed against the body of a patient, a normally open electric switch carried by said handle and electrically connected to said contact, a switch-closing device on said handle adapted to be depressed by a finger of an operator and mechanically interconnected with said switch to close said switch upon depression of said switch-closing device, electric connection means connected to said switch and adapted to be connected to a source of electric power for connection of said source to said contact upon closure of said switch, and a ready-light carried by said handle in close proximity to said device illuminating said device when energized, said ready-light being electrically connected to said electric connection means and thus being energized when said source is in a ready condition, said switch-closing device comprising a push button and the light being mounted in said push button, said push button being at least in part pellucid and thus transmitting light.

3,946,744
ELECTROCARDIOGRAPHY SIGNAL TRANSMISSION-RECEPTION METHOD INCLUDING METHOD OF MEASURING PACEMAKER SIGNAL FREQUENCY

Albert A. Auerbach, New York, N.Y., assignor to Medalert Corporation, New York, N.Y.

Continuation of Ser. No. 257,557, May 30, 1972, abandoned.
This application Aug. 23, 1974, Ser. No. 500,069
Int. Cl.[2] A61B 5/04
U.S. Cl. 128—419 PT 13 Claims


METHOD OF PRECISELY MEASURING PACEMAKER ARTIFACT FREQUENCY
STEP
(a) QRS AND ARTIFACT SIGNAL SENSING AND GENERATION
(b) FM MODULATION
(c) AUDIO TRANSMISSION
(d) LINE COMMUNICATION
(e) DEMODULATION
(f) MARKER SIGNAL GENERATION
MOVING MEDIUM RECORDING WITH CALIBRATION LINES
(g) ARTIFACT FREQ. MEASUREMENT
(h) MARKER SPACING MEASUREMENT
(i) ARTIFACT FREQ. CORRECTION
PRECISE ARTIFACT FREQUENCY

10. A method of precisely measuring the frequency of Pacemaker artifact signals included in electrocardiography signals recorded on a recording medium having equally-spaced calibration lines and designed to move at a desired speed comprising the steps of:

a. generating and recording on the recording medium, at substantially the same time as the recording of the electrocardiography signals and completely independent from the recording medium moving means, periodically-timed marker signals spaced in time so that during that time the moving recording medium will move a desired space relative to the marker signals when at the desired speed;

b. measuring the linear distance between sequential artifact signals on the recording medium as indicated by the calibration lines to determine the measured artifact signal frequency, assuming that the recording medium is moving at the desired speed;

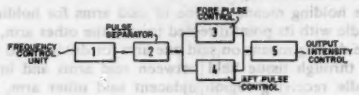
c. measuring the space between selected marker signals to determine if the moving recording medium was moving at the desired speed during the recording, thereby indicating that the measured artifact signal frequency is the correct artifact signal frequency;

d. and obtaining the precise artifact signal frequency if the moving recording medium was not moving at the desired speed by correcting the measured artifact signal frequency in accordance with a correction factor determined by the ratio between the measured space between the selected marker signals and the desired space when the moving recording medium is moving at the desired speed.

3,946,745
APPARATUS FOR GENERATING POSITIVE AND NEGATIVE ELECTRIC PULSES FOR APPLICATION TO A LIVING BODY FOR THERAPEUTIC PURPOSES

Wen Hsiang-Lai, and Gaylord Chan, both of Hong Kong, China, assignors to Biopulse Company Limited, Hong Kong, China

Filed Mar. 18, 1974, Ser. No. 452,125
Claims priority, application United Kingdom, Mar. 22, 1973, 13894/73
Int. Cl.[2] A61N 1/36
U.S. Cl. 128—421 2 Claims

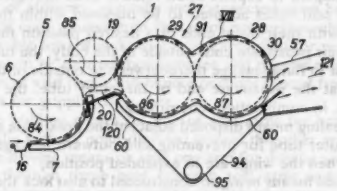


1. Apparatus for generating positive and negative electrical pulses for application to a living body for therapeutic purposes comprising pulse generating means for producing at the output terminals thereof a succession of pairs of electrical pulses of opposite polarity and with adjustable repetition rate, pulse separating means for adjusting the time interval between pulses of opposite polarity of each pair of pulses and for supplying positive pulses to a first output terminal and negative pulses to a second output terminal, first pulse forming means connected to the first output terminal for adjusting the amplitude and width of the positive pulses, second pulse forming means connected to the second output terminal for adjusting the amplitude and width of the negative pulses, and output means for combining the pulses from the first and second pulse forming circuit into an output signal of the apparatus.

3,946,746
HARVESTING MACHINES

Frans J. G. C. Decoene, Zedelgem, and Cornelis G. M. Muljs, Sint-Kruis Brugge, both of Belgium, assignors to Clayson N.V., Zedelgem, Belgium

Filed June 25, 1974, Ser. No. 482,929
Claims priority, application United Kingdom, June 27, 1973, 30634/73
Int. Cl.[2] A01F 12/20, 12/44
U.S. Cl. 130—27 P 12 Claims



1. An agricultural harvesting machine comprising:

a. a frame adapted to travel across a field,

b. means for conveying crop material from the field to the frame,

c. means transversely mounted to said frame rearwardly of the conveying means for threshing grain from the crop material,

d. a rotary separating mechanism mounted to said frame rearwardly of the threshing means and disposed substantially parallel thereto with its ends extending over substantially equal distances past the respective ends of said threshing means, the separating mechanism being adapted to receive crop material from the threshing means over a width substantially corresponding to the

width of the threshing means and to spirally convey said crop material in layers of substantially half the width of said threshing means towards each of its ends while submitting said layers of material to a separating action, and

e. said separating mechanism comprising a transversely-extending separator casing having a substantially forwardly facing infeed opening, the infeed opening having a width substantially corresponding to the width of said threshing means and adapted to receive crop material from said threshing means.

3,946,747
CIGARETTE CUTTING TRAY

Miro O. Staroba, Weston, and Alex Suchostawaski, Mississauga, both of Canada, assignors to V-Master Limited, Scarborough, Canada

Filed Oct. 3, 1974, Ser. No. 511,537
Int. Cl.² A24C *1/24, 1/36, 3/00, 5/12*
U.S. Cl. 131—46 **8 Claims**

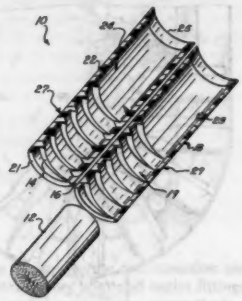
1. In a manually operated machine for making cigarettes comprising (a) a frame; (b) a horizontal platform supported thereby, elongated in the transverse direction, abutment members depending and rearwardly curved from beneath the front portion of said platform; (c) a flexible apron covering the platform, and extending from the front of said platform to beyond the rear thereof, adapted to define a transverse cigarette-forming trough at the rear of said platform; (d) a roller slidable above said platform to form a bight therebetween adapted to compress and roll tobacco onto a piece of cigarette paper to form a long cigarette; and (e) a cutting tray spaced below the bottom surface of said platform and slidable in and relative to said frame between forward and rearward positions, said cutting tray having a forward receiving surface for collecting cut cigarettes and an adjacent rearward cutting surface, a series of transversely spaced, aligned, vertical, rearwardly slanted razor blades projecting from said cutting surface towards and cooperating with said abutment members to cut said long cigarette, an improved cutting tray wherein said blades are clamped in position in blade holders, and said cutting surface has a series of parallel slots transversely spaced a predetermined distance from each other, extending inwardly from the rear edge of said cutting surface in the direction of movement of said tray, said slots comprising engaging means which cooperate with said blade holders to frictionally and releasably engage said blade holders in said slots, whereby the blades and blade holders are maintained in proper orientation and alignment during operation of the machine.

3,946,748
TOBACCO FILTER FOR SMOKING ARTICLES

Sandor Frankfurt, 20550 University Blvd., Shaker Heights, Ohio 44122

Continuation of Ser. No. 325,925, Jan. 22, 1973, abandoned. This application Sept. 19, 1974, Ser. No. 507,413
Int. Cl.² A24B *15/02*
U.S. Cl. 131—261 R **6 Claims**

1. A tobacco filter for smoking articles comprising a holder for a filter medium, said holder having a substantially tubular configuration defining a substantially cylindrical chamber with openings at opposite end portions thereof, a solid unitary compressible filter medium disposed in said cylindrical chamber of said holder for removing harmful constituents from tobacco smoke that flows therethrough, said filter medium having a diameter as least as large as the diameter of said cylindrical chamber to effect engagement of said filter medium with the wall of said cylindrical chamber along substantially the entire length of said filter medium to fill said cylindrical chamber along at least a major portion of the longitudinal axis thereof, and a plurality of ridge means integrally formed with said wall of said cylindrical chamber for radially compressing said filter medium at all points throughout each of a



plurality of spaced apart cross sectional planes at locations which are spaced apart along the longitudinal axis of said holder and disposed substantially perpendicular to the longitudinal axis of said filter medium to provide alternate cross sectional portions of compressed and noncompressed filter medium along the longitudinal axis of said filter medium.

3,946,749
HAIR COSMETIC COMPOSITIONS BASED ON GRAFTED AND CROSSLINKED COPOLYMERS

Christos Papantoniou, Epinay-sur-Seine, France, assignor to L'Oreal, Paris, France

Filed June 19, 1973, Ser. No. 371,513
Claims priority, application Luxemburg, June 20, 1972, 65552
Int. Cl.² A45D *7/00;* **A61K** *7/11*
U.S. Cl. 132—7 **5 Claims**

1. A hair cosmetic composition comprising in a solvent selected from the group consisting of water, an aliphatic alcohol having 1 to 6 carbon atoms and an aqueous-alcoholic solution of said alcohol, 0.4 to 5% by weight of a graft and cross linked copolymer constituted by:

a. 5 to 85% by weight of at least one monomer selected from the group consisting of: vinyl acetate, vinyl stearate, vinyl laurate, vinyl propionate, allyl stearate, allyl laurate, diethyl maleate, allyl acetate, methyl methacrylate, cetyl vinyl ether, stearyl vinyl ether and hexene-1;

b. 3 to 80% by weight of a monomer selected from the group consisting of: crotonic acid, allyloxyacetic acid, vinylacetic acid, acrylic acid, methacrylic acid and N-vinylpyrrolidone;

c. 2 to 50% by weight of polyethylene glycol having a molecular weight between 300 and 30,000; and

d. 0.01 to 8% by weight, based on the total weight of (a) + (b) + (c) of a cross-linking agent selected from the group consisting of: ethylene glycol dimethacrylate, diallyl O-phthalate, diallyl M-phthalate, diallyl P-phthalate, tetraallyloxyethane, and a polyallylsucrose having 2 to 5 allyl groups per mol of sucrose, said copolymer having a molecular weight between 10,000 and 1,000,000.

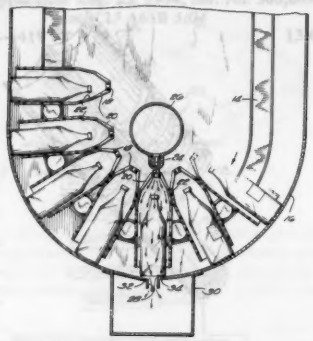
5. A method of setting hair which comprises applying to the hair an effective amount of the composition of claim 1, winding the hair on wavesetting rollers and drying the hair.

3,946,750

LABEL REMOVER FOR BOTTLE WASHING MACHINE

Otto H. Fischer, Milwaukee, and Donald F. Schoenke, Menomonee Falls, both of Wis., assignors to Stowell Industries, Inc., Milwaukee, Wis.

Filed Mar. 5, 1975, Ser. No. 555,415
Int. Cl.² B08B 3/02, 9/08
U.S. Cl. 134—104 8 Claims



1. In a bottle washing machine of the type which conveys bottles through the machine in individual pockets which allow flow of liquid through the pocket, an improved label removal structure, comprising,

a liquid supply manifold provided with a high volume downwardly directed nozzle,

an imperforate guide,

means conveying the pockets over a path in which the bottles in the pockets pass under the nozzle in an upright position,

an opening in the guide below the nozzle for withdrawal of liquid,

and a pump for pumping liquid through the opening and returning it to the supply manifold.

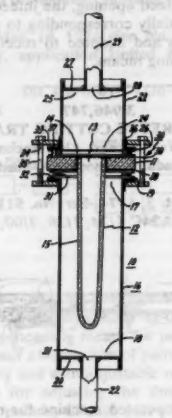
3,946,751

CELL CASING WITH A HERMETIC MECHANICAL SEAL AND A HERMETICALLY SEALED SODIUM-SULFUR CELL

Manfred Wolfgang Breiter, Schenectady; Stephan P. Mitoff, Elnora, and Robert W. Powers, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 18, 1975, Ser. No. 550,464
Int. Cl.² H01M 10/00
U.S. Cl. 136—6 FS 7 Claims

1. A cell casing with a hermetic mechanical seal comprising a ceramic ring, an inner casing of a solid sodium ion-conductive material with one open end, a glass seal sealing a portion of the outer wall of the inner casing adjacent its open end within and to the ceramic ring, a first outer casing portion with at least one open end and a flange at the open end, the first outer casing portion surrounding the inner casing and spaced therefrom, the flange of the first outer casing portion adjacent the ceramic ring, a second outer casing portion with at least one open end and a flange at the open end positioned with the flange adjacent the ceramic ring whereby the second outer casing portion is spaced from and extends in an opposite direction to the first outer metallic casing portion, the first and second outer casing portions joined to the ceramic ring by a hermetic mechanical seal thereby forming a continuous outer cell casing, the hermetic mechanical seal insulated electrically from the outer casing portions, the hermetic mechanical seal comprising a pair of retainer rings, each retainer ring of the pair of retainer rings positioned between the ceramic ring and an adjacent flange of an associated outer casing portion, a pair of open edge metallic sealing rings, each of the pair of sealing rings positioned exteriorly of and spaced from the associated retainer ring, a retaining collar positioned around each outer casing portion and in contact with the opposite surface of the outer casing portion flange, each collar provided with at least



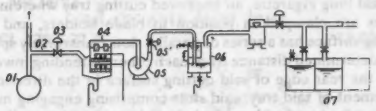
a pair of apertures therethrough, the collars positioned so that the respective apertures of the associated collars are aligned, and a threaded fastener passing through each of the pair of associated apertures the threaded fasteners positioned tightly thereby forming an hermetic seal.

3,946,752

FLUE GAS VALVE FOR THE REFINING PROCESS IN THE INERT GAS SYSTEM

Arao A. Yamamoto, C.P.O. Box 1106, Kobe, Japan

Filed Jan. 23, 1974, Ser. No. 435,988
Claims priority, application Japan, Jan. 24, 1973, 48-10025
Int. Cl.² F16K 3/36
U.S. Cl. 137—246 1 Claim



1. In the flue gas valve for controlling the flow of flue gas from a generator to a receiver having a valve body defining a flue gas passage therethrough, a shaft rotatably mounted on the body transverse to the flue gas passage, a main valve disc fixed to one side of the shaft between the shaft and the receiver and an auxiliary valve disc mounted generally parallel to the main valve disc on the other side of the shaft between the shaft and the generator, and having an air passage for introducing air at a higher pressure than the pressure of the flue gas, the passage for air opening into the space between the valve discs; the improvement comprising the main valve disc having a valve seat ring disposed around the outer periphery thereof for snugly engaging the valve body to close the flue gas passage when said main valve disc is in a closed position transverse to the flue gas passage, the auxiliary valve disc having an outer periphery of slightly smaller radial dimension than said flue gas passage of the flue gas valve so that an air space is provided between the auxiliary valve disc and the valve body when the auxiliary valve disc is in a closed position transverse to the flue gas passage, whereby when said valve discs are closed air passing through the air passage will pre-

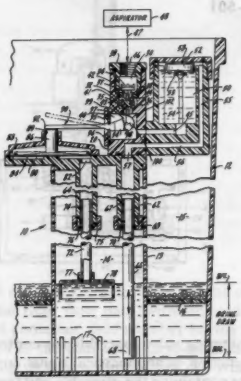
vent flue gases from passing through the flue gas passage of the valve while said valve seat ring of the main valve disc is maintained in snug engagement with said valve body.

3,946,753

PRESSURE SWITCH BRINE SHUT-OFF

Edward J. Tischler, St. Paul, Minn., assignor to Ecodyne Corporation, Lincolnshire, Ill.

Filed Feb. 6, 1974, Ser. No. 440,228
Int. Cl.² B01D 23/20
U.S. Cl. 137—268 12 Claims



1. A control system for a brine tank comprising; in combination:

a. cylinder means positioned within said tank defining a control compartment inside said cylinder means and a brine compartment outside said cylinder means;
b. perforations in a lower portion of said cylinder means to permit brine from said brine compartment to pass therethrough into said control compartment;
c. first tube means extending into said control compartment for alternatively introducing water and removing brine;
d. means associated with an upper end of said first tube means for alternatively introducing water into and drawing a vacuum on said first tube in accordance with a pre-selected cycle;
e. shut-off valve means positioned within a first chamber for controlling the influx of refill water therethrough into said tank;
f. second tube means extending into said control compartment having a lower end at a pre-selected level within said control compartment above the lower end of said first tube means;
g. a second chamber, having a diaphragm means positioned therein, in fluid communication with an upper end of said second tube means such that said diaphragm means deflects relative to the changing air pressure within said second tube means as the water level in said control compartment reaches said lower end of said second tube means;
h. actuation means associated with said shut-off valve means responsive to the deflection of said diaphragm means for movement of said shut-off valve means between an open and closed position dependent upon the water level in said control compartment; and
i. means for adjusting the relative elevations of the lower ends of said first and second tube means for selectively controlling the quantity of brine draw.

3,946,754

GAS METER DISCONNECT DEVICE

Robert W. Cook, 125 Grant St., Decatur, Ind. 40733

Division of Ser. No. 483,672, June 27, 1974, abandoned. This application Apr. 24, 1975, Ser. No. 571,288
Int. Cl.² F16K 43/00
U.S. Cl. 137—315 6 Claims

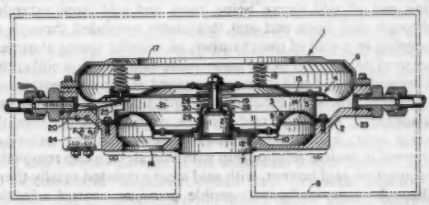
1. A device for facilitating the disconnection and reconnection of a gas meter having inlet and outlet fittings connected to a supply pipe and a service pipe respectively, said device comprising a top plate having an aperture extending therethrough sized to accommodate said gas meter service pipe, said plate being adapted to be releasably clamped about the gas meter service pipe with the gas meter outlet fitting extending substantially to said aperture at the underface of said top plate, a slide plate underlying said top plate with the adjacent faces of the plates contiguous, said slide plate being supported by said top plate, a translating member for moving said slide plate in a plane parallel to the plane of said top plate, a depression in the upper face of said slide plate forming a supply chamber in conjunction with the contiguous underface of the top plate, a supply passage formed in said top plate for providing an alternate supply of gas to said chamber, said chamber registering only with said supply passage when said slide plate is in a first position with relation to said top plate and registering with both said supply passage and said top plate aperture when moved to a second position by said translating member, said slide plate permitting the meter fitting to be moved out of registration with said top plate aperture and said service pipe and simultaneously to move said supply passage into registration with the top plate aperture and said service pipe as said translating member moves said slide plate from its said first to its said second position.

3,946,755

CLIMB AND DIVE VALVE

Jack M. Ulanovsky, Costa Mesa, Calif., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed May 5, 1975, Ser. No. 574,505
Int. Cl.² F16K 31/385
U.S. Cl. 137—493 8 Claims



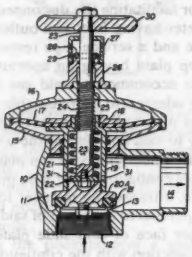
1. A valve assembly comprising a housing having ports respectively exposed to different fluid pressure sources; a valve member movable in said housing to open and close fluid communication between ports exposed to such different fluid pressure sources; said valve member being spring-biased in a

direction to close such fluid communication and having areas on opposite sides thereof exposed to the respective fluid pressure sources whereby predetermined predominance of one source relative to the other source overcomes said spring bias to move said valve member to open communication between said ports; an actuator spring-biased to a stop position in said housing and movable away from said stop position to engage said valve member to move the latter to open such fluid communication in response to predetermined predominance of said other source with respect to said one source; said actuator having areas on opposite sides thereof larger than those of said valve member exposed to the respective sources.

3,946,756
PRESSURE CONTROL VALVE

Glenn E. Specht, Charlestown, W. Va., assignor to A-T-O Inc., Willoughby, Ohio

Filed May 30, 1974, Ser. No. 474,651
Int. Cl.² F16K *31/14*
U.S. Cl. 137—495 **3 Claims**

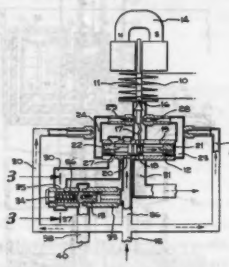


1. A pressure-regulating valve for connection to a riser for use in multistory buildings to fight fire, wherein a valve is connected to the riser at each floor of the building and each valve is preset to obtain a desired flow therefrom at the respective floor, comprising: a valve body having an inlet and an outlet, the axes of the inlet and outlet disposed substantially at right angles to one another; a valve seat in the valve body between the inlet and outlet, the plane of the valve seat disposed transverse to the axis of the inlet; said valve body having an opening therethrough in alignment with the inlet and opposite thereto; a pressure chamber secured to the body in registry with the opening; a diaphragm extending transversely across the chamber and secured at its periphery in the chamber; a hollow, elongate sleeve secured at one end to the diaphragm and extending therefrom through the opening and into proximity at its other end with the valve seat; a valve closure member carried by the other end of the sleeve for opening and closing relationship with the seat; seal means slidably sealing said sleeve in said opening; a valve stem extended through the chamber and coaxially into the sleeve; said one end of said sleeve being open and said stem extended through said open end and threadably extended through an opening in a wall of the chamber; an annular spring abutment secured on one end of the stem inside said sleeve; a coil spring disposed around said stem and engaged at one end against said abutment and at its other end against said sleeve, urging said diaphragm, and thus said closure member, away from the valve seat; a bonnet secured on said chamber exteriorly thereof in sealing relationship with said stem; a cap removably secured on said bonnet, with said stem extended axially therethrough; a normally inaccessible pressure control adjusting collar adjustably secured on said stem between the bonnet and cap and engagable with said cap upon movement of the stem in a valve opening direction to limit opening movement of the valve and thus determine the maximum flow through the valve; a hand wheel secured to the stem exteriorly of the cap for manipulating the valve between open and closed positions; and fluid passage means extending through the sleeve to the pressure chamber on the side of the diaphragm opposite the valve closure member and in communication with the valve outlet, whereby when the valve is open, fluid pressure on the outlet side of the valve is communicated to the pressure chamber and tends to close the valve in opposition to the spring force acting on the diaphragm.

3,946,757
FUEL METERING VALVE

Albert M. Wallace, Westmont, N.J., assignor to TRW Inc., Los Angeles, Calif.

Filed Mar. 28, 1975, Ser. No. 562,871
Int. Cl.² F16K *31/00*
U.S. Cl. 137—501 **11 Claims**



1. A fluid metering valve assembly for controlling the flow of fluid as a function of an electrical signal comprising:

a housing for containing the assembly and transmitting fluid pressure, said housing including an assembly input port and an assembly output port,

electromechanical means carried by said housing and including an armature operative in response to the electrical signal to provide a mechanical displacement,

a pair of nozzles mounted in said housing and operative in conjunction with said armature whereby the displacement of said armature controls the flow of fluid through said pair of nozzles,

first slider means mounted in said housing and operatively responsive to a change in fluid pressure through said pair of nozzles caused by said mechanical displacement of said armature of said electromechanical means to be displaced in accordance with the displacement provided by said armature,

second slider means mounted in said housing and operatively responsive to a change in fluid pressure caused by the displacement of said first slider means to control the flow of fluid through the assembly as a function of the electrical signal, and

spring means secured to said armature of said electromechanical means and positioned to bias said first slider means to further maintain said first slider in equilibrium.

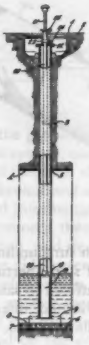
3,946,758
FILLING ARRANGEMENTS FOR FLUID STORAGE CONTAINERS

William P. Hansel, Media, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Continuation-in-part of Ser. Nos. 280,611, Aug. 14, 1972, abandoned, and Ser. No. 214,872, Jan. 3, 1972, abandoned. This application Oct. 3, 1974, Ser. No. 511,821
Int. Cl.² F17D *1/20*
U.S. Cl. 137—590 **6 Claims**

1. A storage tank for a volatile hydrocarbon fluid in which turbulance during fill is minimized which comprises in combination, a storage container for a volatile hydrocarbon fluid, a fillpipe extending into said container from outside the same

and having a small transverse cross-sectional area compared to that of said container taken in the same plane, the velocity of fluid flow through said pipe during a container filling operation being such that said volatile hydrocarbon fluid possesses a substantial amount of kinetic energy; and a porous foamed hydrocarbon resistant disperser/diffuser member, having a high ratio of void volume to total volume, positioned at the



bottom of said storage container adjacent the opening in said pipe and in the fluid flow path between said pipe and the interior of said container, said member having a surface area large compared to the transverse cross-sectional area of said pipe and having therein a multiplicity of tortuous fluid passages whose total area is large compared to the transverse cross-sectional area of said pipe.

3,946,759

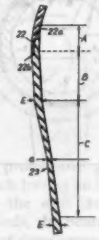
PRESSURE VESSEL HAVING A DEFORMABLE BLADDER THEREIN

Jacques H. Mercier, 49 Rue de Naples, Paris, France

Division of Ser. No. 224,801, Feb., 1972, Pat. No. 3,830,259. This application June 26, 1974, Ser. No. 483,305

Int. Cl.² F16L *55/04*

U.S. Cl. 138—30 **1 Claim**



1. As an article of manufacture, a bladder for a pressure vessel of the type comprising a rigid hollow container having axially aligned ports, said bladder intervening between said ports and defining two chambers in communication respectively with said ports, said bladder being of resilient deformable material and comprising two substantially cup-shaped sections, each having a rim, means connecting the rims of said sections to define a bond zone therebetween which is subject to the stresses imparted to the bladder as a result of the stretching thereof in operation, characterized by said bladder having in proximity to said bond zone, a stress relief zone, the width of said stress relief zone being at least equal to that of the bond zone and the distance separating said zones being less than twice the width of said bond zone, said stress relief zone being adapted substantially to absorb the stresses resulting from stretching of the bladder, to which the bond zone would otherwise be subjected, said bladder having a reduced wall thickness defining said stress relief zone, the latter comprising a decreasing thickness zone spaced from the bond zone immediately followed by an increasing thickness zone, the thickness of the portion of the bladder wall defining said stress relief zone being gradually reduced from the extremities of the stress relief zone to the middle portion thereof, the thickness of the bladder wall at the middle portion of the stress relief zone being between one-third to one-half the thickness of the bladder wall at the extremities of said stress relief zone.

3,946,760

HYDRAULIC MODULATOR VALVE

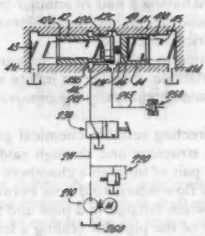
Noboru Murakami, Nagoya; Koichiro Hirozawa, Kariya, and Shigeo Takahashi, Hekinan, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Continuation of Ser. No. 269,102, July 5, 1972, abandoned. This application Aug. 9, 1974, Ser. No. 496,263

Claims priority, application Japan, July 8, 1971, 46-50812; July 10, 1971, 46-51168; Sept. 9, 1971, 46-69981

Int. Cl.² F15B *13/042*; **F16L** *55/04*

U.S. Cl. 138—31 **2 Claims**



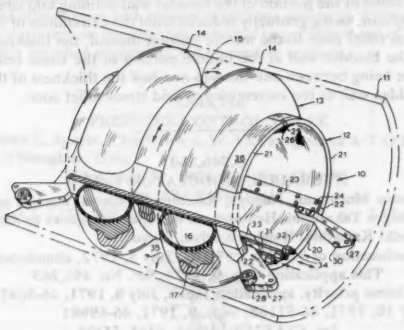
1. In an hydraulic modulator of the type including a casing with a bore therein, first and second ports in said casing, a stepped spool axially and slidably engaged within said bore and forming with the circumference of the bore an annular fluid throttle passage between said ports, and spool actuating means for controlling axial displacement of the spool, the improvement wherein said stepped spool comprises a large diameter portion hermetically engaged within said bore, a small diameter portion and a medium diameter portion in sequence and both slightly lesser diameter then said bore, said throttle passage being formed by said bore and said medium and small diameter portions of said spool, wherein said spool actuating means comprises a pressure responsive means on said spool and a pressure chamber formed in the bore of said casing in open communication with said second port, resilient means for biasing said spool to its normal position such as to hold said throttle passage in the maximum length thereof, and an accumulator disposed within said pressure chamber, wherein said accumulator comprises a piston axially slidably engaged within said bore and resilient means biasing said piston toward said spool, and wherein a stopper means is provided in said pressure chamber which engages both said spool and piston when in their normal positions to limit further motion of the spool and piston toward one another.

3,946,761

PACKER FOR SEALING PIPE LEAKS

William B. Thompson, and James T. Conklin, both of Orlando, Fla., assignors to The Penetryn System, Inc., Winter Park, Fla.

Filed June 24, 1974, Ser. No. 482,442
Int. Cl.² F16L 55/16
U.S. Cl. 138—98 17 Claims



1. A pipe leak sealing apparatus for sealing pipes internally comprising:

a segmented hollow cylindrical structure having a plurality of openings therein and having a base segment and at least one foldable segment for partially collapsing said cylindrical structure;

a single sleeve having a pair of annular inflatable chambers formed in said sleeve, said single sleeve being located on said cylindrical structure;

means for directing fluid under pressure into each said annular inflatable chamber to inflate said chambers and to deflate said chambers by the removal of fluid from said chambers;

means for directing settable chemical grouts through said cylindrical structure and through said single sleeve between said pair of inflatable chambers whereby chemical grouts may flow into a void area between said inflatable chambers when inflated in a pipe and the adjacent internal surface of the pipe for sealing a leak in the pipe;

said single sleeve having a pair of annular, inflatable chambers of a flexible material, reinforced therein with reinforcing chord whereby greater inflated strength is provided for said chamber and each said chamber has a nipple passing through a cylindrical structure opening and operatively connected to said means for directing fluid thereinto, and said sleeve having an annular spacing portion connecting said inflatable chambers together in spaced relationship, said spacing portion of said sleeve being operatively connected to said means for directing settable chemical grouts between said cylinder for directing said chemical grouts through said connection portion of said sleeve; and

said single sleeve being held onto the exterior of said cylinder by the connections with said means for directing fluid into said chambers and the connections with said means for directing chemical grouts through the spacing portion between said inflatable chambers.

3,946,762

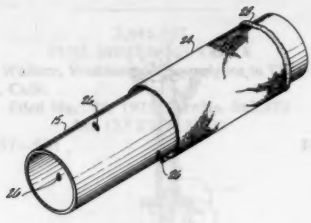
UNDERGROUND IRRIGATION SYSTEM

Edwin J. Green, 10210 Baseline Road, Altaloma, Calif. 91701

Filed July 29, 1974, Ser. No. 492,963
Int. Cl.² F16L 9/18
U.S. Cl. 138—140 3 Claims

1. A conduit system particularly adapted for the distribution of fluid below the surface of the ground, comprising:

a tubular conduit having an open inlet end, said conduit having one or more other ends which are closed, said conduit having a plurality of apertures in the wall thereof located at spaced intervals along the length of said conduit and positioned radially about the periphery thereof;



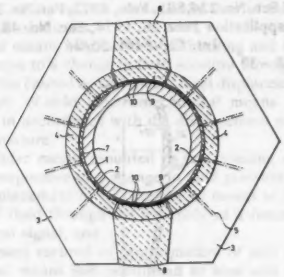
a continuous fabric sheath surrounding the exterior of said conduit covering all of said apertures, the ends of said sheath being sealingly affixed to said conduit, said sheath having uniformly distributed interstices in the fabric thereof which are capillary in size.

3,946,763

ELONGATE UNITS SUITABLE FOR USE AS FURNACE SKIDS OR THE LIKE

Brian J. Wilce, Inner Court, Pewley Hill, Guildford, Surrey, England

Filed July 31, 1974, Ser. No. 493,429
Claims priority, application United Kingdom, Aug. 16, 1973, 38727/73
Int. Cl.² F16L 9/14
U.S. Cl. 138—147 7 Claims



1. For use in a furnace, a construction comprising a hollow metal pipe for a coolant and a cladding assembled from a plurality of sections, each of which comprises a metal backing member in contact with the pipe, a first layer of material of low thermal conductivity in the range of 0.5 to 1.5 BTU's per square foot per °F per hour per inch surrounding the backing member, and a second layer of refractory material surrounding the first layer, said section being held together by anchors which are secured to the backing member and extend outwardly from the backing member and are embedded in the second layer, to hold the first and second layers to the backing member.

3,946,764

INSULATOR SLEEVE FOR CONDUITS

Franklin R. Hubbell, III, Brooklyn, Mich., assignor to Tenneco Inc., Racine, Wis.

Filed July 22, 1974, Ser. No. 490,345
Int. Cl.² F16L 9/14
U.S. Cl. 138—148 10 Claims

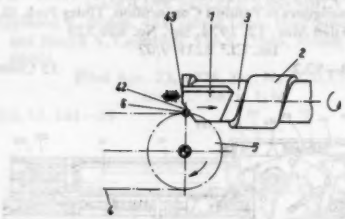
1. An insulator for the gas flow conduit of an internal combustion engine exhaust system, comprising a one piece imperforate wall sheet metal insulator sleeve elastically expandable to increase its circumference and adapted to be assembled and mounted on a selected intermediate section along the length of the conduit by movement thereof transverse to its length and to that of the conduit, said sleeve having a conduit receiving opening along one side extending the full length of the sleeve, said opening being less in width than the conduit but expansible to a width greater than that of the conduit upon elastic circumferential expansion of the sleeve whereby said sleeve may be installed on the conduit by movement transverse to the length of the circuit.

3,946,765

MECHANISM FOR FEEDING THE SHUTTLES INTO THE WEAVING CYLINDER OF AN AUTOMATIC WAVE SHED LOOM

Ludwig Guenther; Guenter Welzel, both of Karl Marx Stadt, and Rainer Janausche, Negersdorf, all of Germany, assignors to VEB Wirkmaschinenbau Karl-Marx-Stadt, Karl-Marx-Stadt, Germany

Filed Nov. 8, 1974, Ser. No. 522,072
Int. Cl.² D03D 47/26
U.S. Cl. 139—12 8 Claims



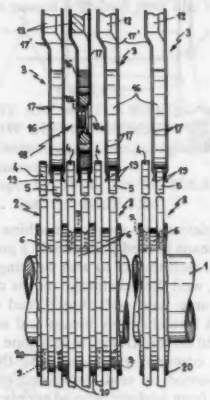
1. In an automatic progressive shed loom, comprising a plurality of shuttles, each having an inclined trailing edge, and means for beating up the weft threads and propelling the shuttles through the sheds, the beating up and driving means comprising a plurality of discs arranged on an axis of rotation side by side and each having a plurality of projections for driving the shuttles, the discs being arranged with the projections thereof progressively out of phase from one disc to the next so as to define a spiral groove between the projections, the improvement comprising means for inserting the shuttles into the groove, the inserting means comprising an endless conveyor, a plurality of driving pins mounted on the conveyor and means for guiding the conveyor in a straight path substantially parallel to the axis of said discs to an entry end of said groove and then guiding the conveyor through a path which substantially reverses the direction of the conveyor, the inclined trailing edge of each shuttle being engaged by one of said pins while the conveyor is moving toward the entry end of said groove, the conveyor being so positioned relative to the entry end of said groove and the direction of the inclination of the trailing edge of the shuttle being opposite the inclination of the groove so that as the shuttle enters the groove the pin engages said trailing edge of the shuttle at a point on the trailing edge located forward of the entry end of said groove.

3,946,766

POWER LOOM DOBBY SHEDDING MOTION

Luc Amigues, 25, avenue Gabriel Peri, 94300 Vincennes, France

Filed Jan. 13, 1975, Ser. No. 540,466
Claims priority, application France, Jan. 28, 1974, 74.03543
Int. Cl.² D03D 1/00
U.S. Cl. 139—66 R 2 Claims



1. A power loom dobby shedding mechanism of the type having multiple arms mounted on pivot shaft means and connected respectively to operate the lift levers of conventional heddle or warp frames when the arms are oscillated about the axis of the pivot shaft means, and the mechanism having multiple pairs of cams mounted for rotation with a drive shaft of the dobby, the cams of each pair being spaced apart along the axis of the drive shaft and having respective peripheral races disposed in opposed relationship to an arm, and each arm having two follower rollers rotatably supported thereon on different sides of said pivot shaft means and respectively contacting different races of an opposed pair of cams, and the races of each pair of cams being mutually shaped and positioned about the axis of the drive shaft so that rotation of the shaft causes oscillation of the arms, the improvements wherein:

each arm comprises a thin flat member located opposite the cams of the associated pair and within the axial extent of their races;

first and second pairs of strips, the strips in each pair being fixed to opposite sides of the arm and each pair of strips extending toward and beyond the peripheries on opposite sides of a race and each pair of strips supporting rotationally a follower roller therebetween and in contact with one of said races, the first and second pairs being mutually offset axially of the shaft means in different directions so that each pair engages a different cam;

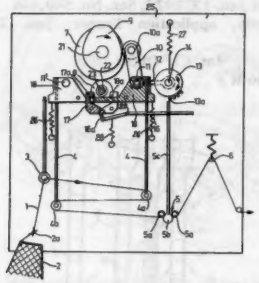
the follower rollers having axial thicknesses greater than the cams, and the outer ends of each pair of strips beyond the roller being formed toward and then away from each other to provide surfaces riding on the sides of the cams to keep the follower rollers centered on the races.

3,946,767

SHUTTLELESS WEB WEAVING MACHINE

Jakob Muller, Frick, Switzerland, assignor to Patax Trust Reg., Liechtenstein

Filed May 31, 1974, Ser. No. 475,185
Claims priority, application Switzerland, June 1, 1973, 7922/73
Int. Cl.² D03D 47/34, 47/36
U.S. Cl. 139—122 H 1 Claim



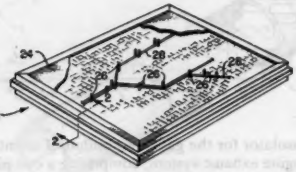
1. In a shuttleless web weaving machine provided with weft thread feed means to feed periodically a predetermined length of at least one weft thread to web weaving means included in said machine, weft thread storage means comprising, in combination, a frame; said weft thread feed means including at least one weft thread supply means and an associated thread brake mounted on said frame; at least one weft thread storage device, each comprising at least one thread storage lever pivotably mounted on said frame and engaged with a weft thread drawn from said weft thread supply means through said thread brake; and control means operable to control each storage device in timed coordination with the operation of said weft thread feed means; said control means including cam means rotatably mounted on said frame and respectively associated with each storage device to pivotably displace, before the commencement of each weft thread feed, each storage lever of the respective storage device from a first position to a second position, thereby to withdraw said predetermined lengths of weft thread from the associated supply means through the associated thread brake, and to effect storage of said predetermined length of weft thread in the associated storage device, and means operable to release each stored weft thread at the commencement of each weft thread feed to provide for said weft thread feed means to feed the stored length of weft thread from the associated storage device at a substantially constant tension; respective tensioning means engageable with each weft thread delivered from a storage means; a respective thread clamping device operatively engaged with the weft thread between the associated tensioning means and the last storage lever of the associated storage device; the effective length of each thread storage lever being presettable to enable the length of thread stored in the respective storage device to be predetermined in accordance with the breadth of the web to be woven by said machine; said storage means comprising at least two storage devices; a shaft rotatably mounted in said frame; at least two cam members mounted on said shaft to be rotatable therewith; a respective latching mechanism to latch each storage lever of each storage device; and a respective linkage system operable to couple each latching mechanism and the associated clamping device to a respective one of said cam members; whereby, for each weft feed operation, the respective thread clamping device and the respective latching mechanism in only one of said storage devices is releasable.

3,946,768

WIRE HARNESS BOARD

Arthur A. Fiorentino, Piscataway, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed July 25, 1972, Ser. No. 275,073
Int. Cl.² B21F 3/00
U.S. Cl. 140—92.1 3 Claims



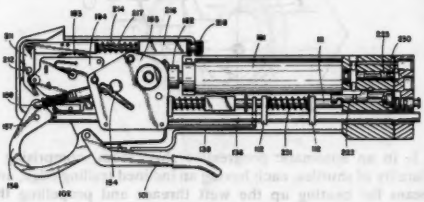
1. A wire harness board comprising:
a. a panel including a body with upper and lower parallel surfaces,
b. said panel being formed of a resilient closedcell material,
c. first and second layers of wire mesh secured to the upper and lower surfaces of said panel,
d. an inwardly opening frame for receiving said panel and retaining same therewithin,
e. a plurality of elongated pins detachably insertable through said panel and through selected openings in at least one of said layers of wire mesh,
f. the openings in the wire mesh being slightly greater in size than the diameter of the pins inserted therethrough,
the invention being characterized in that said wire mesh layers are permanently embedded within the body of said panel at the upper and lower surfaces thereof so that said pins are guided in a vertical direction through said panel.

3,946,769

AUTOMATIC CABLE TIE INSTALLATION TOOL

Jack E. Caveney, Hinsdale; Roy A. Moody, Flossmoor; Ronald T. Fulton and Charles J. Rehling, both of Tinley Park, all of Ill., assignors to Panduit Corporation, Tinley Park, Ill.

Filed Mar. 12, 1974, Ser. No. 450,523
Int. Cl.² B21F 9/02
U.S. Cl. 140—93.2 15 Claims

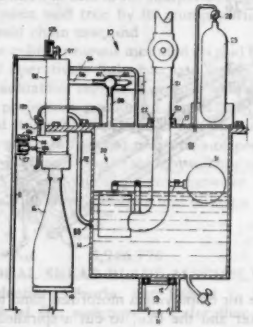


1. A tool for fastening a cable tie having a strap portion and a head portion about a bundle of wires or the like comprising tensioning means for tensioning the cable tie about the bundle of wires or the like, severing means for cutting the tail of the strap portion once it has been tensioned about the bundle of wires or the like, said tensioning means comprising a rotary driven member adapted to develop a tension in the cable tie, said rotary driven member being spaced from a fixed strap guide a distance to define an interference fit for the strap portion, and biasing means for restraining movement of said severing means until a predetermined tension is developed in said cable tie, actuation of said severing means being independent of operator decision once the predetermined tension is developed.

3,946,770
BOTTLE FILLING MEANS AND METHOD

John Thomas Trinne, Box 197, Greenock Road, Nuriootpa, Australia (5355), and Leslie John Wilksch, King St., Stockwell, Australia (5350)

Filed Nov. 19, 1974, Ser. No. 525,195
Claims priority, application Australia, Nov. 22, 1973, 5728/73
Int. Cl.² B65B 3/04
U.S. Cl. 141—5 13 Claims



10. A method of filling a bottle with liquid containing gas under superatmospheric pressure comprising the steps:

a. charging a bowl with said liquid and with gas at superatmospheric pressure,

b. positioning said bottle over a syphon tube,

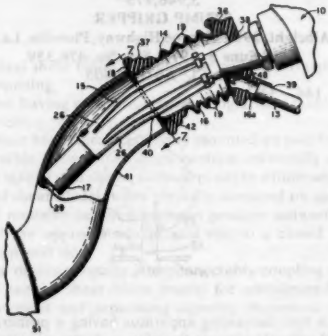
c. opening a liquid flow valve to initiate a syphon induced liquid flow from the bowl to the bottle and opening a bottle venting valve to vent displaced air or gas from the bottle and

d. removing the bottle from the syphon tube after filling.

3,946,771
GASOLINE NOZZLE ASSEMBLY

Raymond E. Braun, 481 Vassar Lane, DesPlaines, Ill. 60016, and Joseph A. Capozzoli, 516 S. Owen, Mount Prospect, Ill. 60056

Filed Apr. 23, 1975, Ser. No. 570,576
Int. Cl.² B67C 3/34
U.S. Cl. 141—59 11 Claims



1. A nozzle assembly adapted to pass fluid, by means of a fluid outlet line, into any one of a plurality of tank lines, each of said tank lines defining a tank line port; said nozzle assembly being further adapted to receive vapors passing through said tank line port from any of said tank lines, the invention comprising:

spring means, secured to said fluid outlet line, having a member spaced therefrom; said member being adapted to be compressed toward said fluid outlet line upon insertion of said fluid outlet line into any one of said tank lines for applying a force against said tank line to help maintain said fluid outlet line therein;

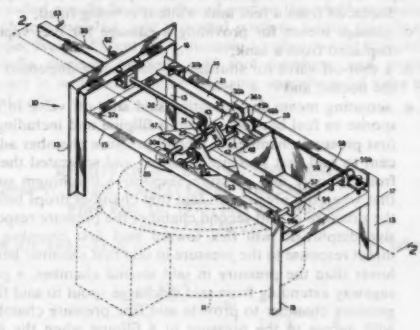
collar means, surrounding a portion of said fluid outlet line and overlapping at least a portion of said spring means, said collar means having a distal end, secured to said fluid outlet line, and a free proximal end, terminating in lip means adapted to form a seal about said tank line port upon insertion of said fluid outlet line into said tank line; and

vapor return means, at least partially defined by a space between said collar means and said fluid outlet line, for passing vapors from said tank line, whereby fluid may be passed from said fluid outlet line into said tank line, and vapors may be passed from said tank line into said vapor return means.

3,946,772
CLOSURE GATE APPARATUS HAVING MATERIAL FLOW GUIDING STRUCTURE

Erbie Gail Mize, Chattanooga, Tenn., assignor to Astec Industries, Inc., Chattanooga, Tenn.

Filed Sept. 13, 1974, Ser. No. 505,672
Int. Cl.² B65B 1/04
U.S. Cl. 141—98 10 Claims



1. Gate apparatus for selectively opening and closing a material flow aperture, comprising:

closure means for a material flow aperture;

first means connected to said closure means and selectively operative to move said closure means either to a first position substantially aligned with such aperture or to a second position laterally displaced from such aperture;

second means interconnected between said closure means and said first means and responsive to further operation of said first means after attainment of said first position by said closure means to dispose said closure means in closure relation with such material flow aperture; and

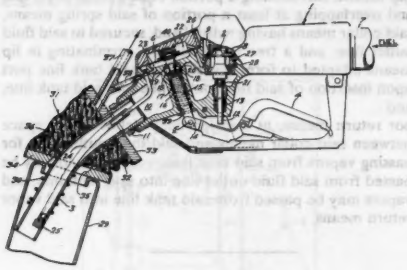
said second means being operative in response to initial movement of said first means in a direction away from said first position to withdraw said closure means from said closure relation.

3,946,773

AUTOMATIC DISPENSING NOZZLE ADAPTED FOR VAPOR RECOVERY

William B. Hansel, Media, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed May 10, 1974, Ser. No. 468,841
Int. Cl.[2] B65B 3/18, 57/14
U.S. Cl. 141—206 6 Claims



1. A nozzle for dispensing fuel into a fillpipe of a motor vehicle fuel tank and having a vapor recovery system for recovering fuel vapors displaced from a fuel tank while it is being filled and also having a system for shutting off the fuel being dispensed when fuel backs up into a fillpipe, and comprising:

a. a discharge spout adapted for insertion into a fillpipe of a motor vehicle fuel tank;

b. means for sealingly coupling the nozzle to a fillpipe to prevent the venting into the atmosphere of fuel vapors displaced from a fuel tank while it is being filled;

c. passage means for providing a passage for fuel vapors displaced from a tank;

d. a shut-off valve for shutting off fuel being dispensed by the nozzle; and

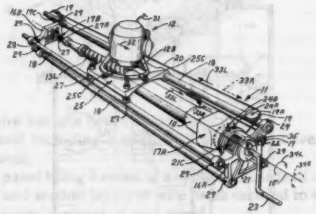
e. actuating means for actuating said shut-off valve in response to fuel backed up into a fillpipe and including a first pressure chamber, a second pressure chamber adjacent to said first pressure chamber and separated therefrom by only one pressure responsive diaphragm such that when the pressure in said first chamber drops below the pressure in said second chamber the pressure responsive diaphragm will flex toward said first chamber in direct response to the pressure in said first chamber being lower than the pressure in said second chamber, a passageway extending from said discharge spout to said first pressure chamber to provide said first pressure chamber with access to the pressure in a fillpipe when the discharge spout is inserted therein, means for providing said second pressure chamber with access to the pressure in a fillpipe to substantially balance the pressures in said first and second pressure chambers when fuel is being dispensed from the nozzle in a normal fashion and fuel has not backed up into a fillpipe, means for introducing a vacuum source to said first pressure chamber, whereby when fuel is being dispensed from the nozzle in a normal fashion said vacuum source draws vapors through said first pressure chamber from said passageway and when fuel backs up into a fillpipe the end of the passageway at the discharge spout becomes covered with fuel which prevents vapors from being drawn into said first pressure chamber from said passageway and thereby results in a lowering of pressure in said first pressure chamber relative to the pressure in said second pressure chamber, and means responsive to a lowering of pressure in said first pressure chamber relative to the pressure in said second pressure chamber for closing said shut-off valve, said pressure responsive means including said only one pressure responsive diaphragm which flexes toward said first chamber in direct response to the pressure in said first chamber being lower than the pressure in said second chamber.

3,946,774

DEVICE FOR EMPLOYING A MOTORIZED HAND TOOL TO CUT A SPIRALLED GROOVE IN A WORKPIECE

Wilfred M. McCord, Jr., Louisville, Ky., assignor to Vermont American Corporation, Louisville, Ky.

Filed Oct. 17, 1974, Ser. No. 515,475
Int. Cl.[2] B23B 5/46; B27C 5/10
U.S. Cl. 142—26 4 Claims



4. A device for employing a motorized hand tool, such as a portable router and the like, to cut a spiralled groove in a workpiece, such as a leg for a table, chair, and the like, comprising:

a. frame means including end block means rotatably journalling chuck means for holding the workpiece for rotation around an axis and guide means interconnected to said end block means guiding bracket means for supporting the motorized hand tool for movement with respect thereto in a direction generally parallel to said axis; and

b. drive means mounted on said frame means and being interconnectable between said bracket means and said chuck means to cause movement of the motorized hand tool in a direction generally parallel to said axis in response to rotary movement of the workpiece around said axis,

c. said drive means comprising:

i. pulley means rotatably mounted on said frame means;

ii. endless cable means tightly mounted around said pulley means and said rotatable chuck means; and

iii. fastener means for readily detachably connecting said bracket means to said endless cable means.

3,946,775

STUMP GRIPPER

Alva Z. Albright, 2909 Monroe Highway, Pineville, La. 71360

Filed June 5, 1974, Ser. No. 476,359
Int. Cl.[2] A01G 23/08
U.S. Cl. 144—34 A 1 Claim

1. In a tree harvesting apparatus having a pusher, a chain saw, and actuating means therefor, a stump gripper comprising:

a. a base having forwardly directed upper and lower parallel edges, and a projection portion extending forwardly on a side of said base with upper and lower edges facing and

contiguous with said base parallel edges, the upper edge of the projection portion being flat for making surface contact with a trunk portion of a tree, and said lower edge being sharpened for penetrating engagement with a stump portion of said tree, and said chain saw being adapted to swing toward said forward projection between said projection portion parallel edges and cut said tree therebetween;

b. a stump gripping arm pivotally mounted on the bottom of said base and extending approximately parallel to said forward projection portion and adapted to swing toward it in opposition to said lower sharpened edge for engaging therebetween said tree by its stump portion below the path of said chain saw; and

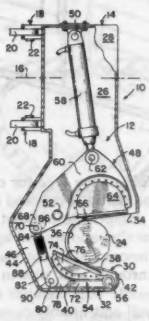
c. hydraulic cylinder means mounted on said bottom of said base and operatively linked to said stump gripping arm for the actuation thereof toward and away from said forward projection portion to respectively grip and release said stump portion of said tree positioned between said arm and said forward projection respectively before and after said tree is cut to thereby anchor said harvesting apparatus to said stump portion between opposed arm and projection during cutting and felling a tree.

3,946,776

DUAL SHEAR BLADE ASSEMBLY

Dorrance Oldenburg, Peoria, and Robert L. Fischer, New Lenox, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 8, 1975, Ser. No. 566,165
Int. Cl.² A01G *23/08*
U.S. Cl. 144—34 E **12 Claims**



1. A dual shear blade assembly for cutting through an article, comprising;

a frame having an outwardly opening article receiving slot therein;

first shear blade means pivotally mounted on said frame and movable between an open position outwardly adjacent one side of said slot to a closed position within said slot;

second shear blade means pivotally mounted on said frame and movable between an open position outwardly adjacent the opposite side of said slot to a closed position within said slot;

linkage means pivotally interconnectably coupling said first and second shear blade means for coordinated closing movement and separating opening movement thereof; and

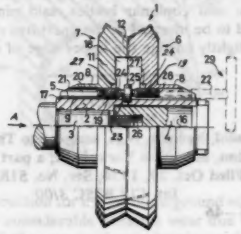
motor means pivotally connected to said frame and one of said first and seond shear blade means for powerably closing it, and thereby also the other one of said first and second shear blade means for cleanly severing the article disposed in said slot.

3,946,777

EDGE MACHINING TOOL CONSTRUCTION

Eberhard Heimbrand, Horb, Germany, assignor to Ledermann & Co., Horb, Germany

Filed Sept. 30, 1974, Ser. No. 510,544
Claims priority, application Germany, Sept. 28, 1973, 2348731
Int. Cl.² B27G *13/12*; B23D *13/00*
U.S. Cl. 144—90 A **10 Claims**



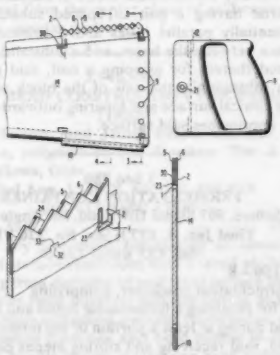
1. An edge machining tool especially for machining the edges of panels which comprises: a pair of disc-like tool members in adjacent coaxial relation and having cutting element means on the periphery thereof, a work spindle supporting said tool members and operable to drive the tool members in rotation, each said tool member having axial portions axially overlapping the other tool member, and at least one adjusting member connected to said tool members and operable for adjusting said tool members relatively in the axial direction on said work spindle, said adjusting member comprising a threaded spindle having a thread portion threadably engaging each tool member, said threaded portions having threads of respectively different pitch thereon, a collar on said threaded spindle disposed between said tool members, and recess means in said work spindle engaging opposite axial sides of said collar.

3,946,778

REMOVABLE CUTTING MECHANISM

Eugene W. Knuth, Land O Lakes, Wis. 54540

Filed Feb. 10, 1975, Ser. No. 548,589
Int. Cl.² B27B *21/00*
U.S. Cl. 145—31 A **4 Claims**



1. Means for the conjunction of plural substantially rigid planar bodies comprising:

a first elongated body provided with four edge surfaces, at least one of which is provided with a chamfer, said body

being further provided with apertures along its length below said chamfered surface;

a second elongated body having four edges, the first edge of which has a surface chamfered to mate with the chamfered edge surface of said first body, said second body having resilient strips along its length substantially coplanar with said bodies but perpendicular to said edge surfaces, one end of said resilient strip being firmly affixed above said first edge to said second body, the other end of said resilient strip terminating in a pin which is transverse to said coplanar bodies, said pin being suitably oriented to be inserted in the apertures of the first body, and to tightly engage the upper edge of said aperture.

3,946,779

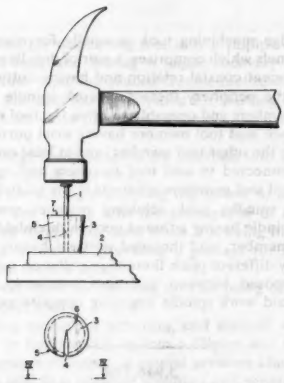
NAIL GUIDE

Daniel H. Sudol, Newark, N.J., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Oct. 29, 1974, Ser. No. 518,360

Int. Cl.² B25C *3/00*

U.S. Cl. 145—46 **1 Claim**



1. A nail guide for holding a nail in position during initial driving of the nail into an object, said nail guide comprising

a substantially frustoconical block of substantially resilient material having a pair of spaced substantially planar substantially parallel bases and a substantially conical surface between the bases, and a substantially radial slot formed therein for gripping a nail, said slot extending from substantially the axis of the block to the substantially conical surface and tapering outward from said axis as it approaches said surface.

3,946,780

FERMENTATION CONTAINER

John C. Sellers, 507 Signal Hill Road, Barrington, Ill. 60010

Filed Jan. 4, 1973, Ser. No. 320,911

Int. Cl.² B65D *33/16*

U.S. Cl. 150—8 **12 Claims**

1. A fermentation container, comprising

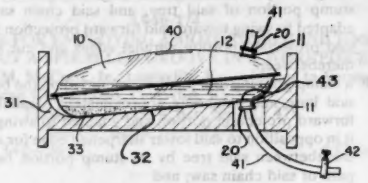
means for receiving a fermentable liquid and for storing said liquid during at least a portion of the fermentation of said liquid, said receiving and storing means comprising

a nonporous plastic bag having an opening,

a closure receiving structure secured to the bag communicating with said opening,

a closure in sealing engagement with the structure and removable from the structure and

diaphragm means disposed on said closure for enabling the escape of fermentation gases from said bag, said diaphragm means having a Gurley porosity in the range



of 2 to 120 seconds and for preventing gas and moisture from entering said bag.

3,946,781

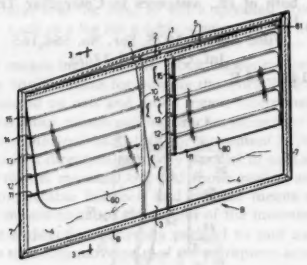
CREDIT CARD BILLFOLD AND A FLEXIBLE CARD PROTECTING FLAP

John P. Reis, West Bend, Wis., assignor to Amity Leather Products Co., West Bend, Wis.

Filed Apr. 25, 1975, Ser. No. 571,735

Int. Cl.³ A45C *11/18*

U.S. Cl. 150—35 **9 Claims**



1. A multi-card billfold of the type for carrying a plurality of cards in shingled, and partially exposed relationship to one another, said billfold comprising at least one flexible wall having a plurality of parallel and spaced apart slits therein, a plurality of pockets disposed adjacent said flexible wall for receiving said cards through said slits in stacked, shingled relationship, and a flexible flap member secured along one edge to said flexible wall and liftably covering the front surface of said front flexible wall so as to cover cards projecting from said respective slits for securing said cards in said pockets.

3,946,782

PNEUMATIC TIRE WITH LIGHT REFLECTIVE ELEMENTS

Stephen Edward Petrasek, and Charles Steven Cooke, both of Akron, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

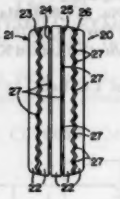
Filed Sept. 18, 1974, Ser. No. 507,098

Int. Cl.² B60C *11/00*

U.S. Cl. 152—330 R **5 Claims**

1. A vehicle tire comprising a plurality of light reflective elements located on the periphery of said tire to reflect light in a direction perpendicular to the axis of rotation of said tire having one of said reflective elements located on each shoulder area of the tire 180° from the corresponding reflective element in the opposite shoulder of the tire, said two elements each define a peak of a sine wave having a length equal to the circumference of said tire, and a plurality of reflective elements located on the tire periphery on said sine wave, defined

by said peak elements and said tire circumference, intermediate said peak elements so that said tire gives a sine wave type



optical response with the frequency of said sine wave dependent upon the rate of tire rotation.

3,946,783

PNEUMATIC TIRES

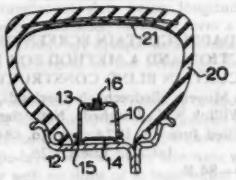
Reginald Harold Edwards; Geoffrey Lionel Coulter, both of Sutton Coldfield; Alan Michael Dodd, Walsall; Michael John Kenney, Sutton Coldfield; Alan John Bourne, Sutton Coldfield, and David Alexander Bird, Sutton Coldfield, all of England, assignors to Dunlop Limited, London, England

Continuation of Ser. No. 353,938, April 24, 1973, abandoned. This application Dec. 23, 1974, Ser. No. 536,945

Claims priority, application United Kingdom, Sept. 2, 1972, 40823/72

Int. Cl.² B60C *17/00, 17/04*

U.S. Cl. 152—330 L **15 Claims**



1. A pneumatic tire and rim assembly capable of being run in a deflated condition comprising:

a. a pneumatic tire having an interior surface and mounted upon a rim, to define an inflation chamber, said assembly having means to prevent the tire beads from becoming dislodged from the rim when operated in a deflated condition;

b. means at least for lubricating contacting interior surfaces of the tire when operated in a deflated condition comprising a composition having a plurality of ingredients at least one of said ingredients being a lubricating material;

c. said composition being carried in the assembly in at least two parts, one part comprising a gelled lubricating material, the other part comprising a break down reagent for said gel;

d. enclosing means for enclosing the part comprising a break down reagent for the gel separately from the gel;

e. the gel being carried on the interior surface of the tire;

f. said enclosing means being adapted to release the part of the composition comprising break down reagent into said inflation chamber upon deflation or substantial loss of inflation pressure to permit said break down reagent to dilate the gel and form a mobile lubricating composition.

3,946,784

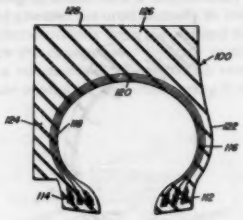
TIRE WITH WIDE LATERALLY OFFSET TREAD

Robert J. Keith, 65 Devonshire, Great Falls, Mont. 59405

Filed June 11, 1974, Ser. No. 478,772

Int. Cl.² B60C *5/00*

U.S. Cl. 152—352 R **2 Claims**



1. A tire construction for use on underground mining equipment subject to considerable abrasive wear due to the environment in which they are used and wherein regular oversized tires cannot be used because of clearances of the mechanical linkages underneath the vehicle and between the wheels and yet the outerside tire walls are subject to much greater wear than the tread portion, including a basic symmetrical casing structure of the type including a pair of outwardly arched annular side wall portions interconnected at their outer peripheral portions by means of an integral outwardly arched generally cylindrical crown portion extending therebetween, and a tread strip extending about said casing, said tread strip including opposite side annular portions and an outer connecting portion connecting the outer peripheries of said opposite side annular portions, said opposite side annular portions overlying and adhered to said side wall portions completely along the annular casing without any gaps and said connecting portion overlying and adhered to said crown portion, one of said side annular portions extending inwardly to a point disposed radially outwardly of the zone of maximum width of said casing and the other side annular portions extending inwardly past the zone of maximum width of said casing and including a thick portion thereof overlying the outer surface of the corresponding casing side wall and approximately as thick again as the regular casing structure for protecting the outer side of the casing from cuts and abrasive wear, the outer side face of said other side annular portion extending generally radially outwardly to the outer surface of said connecting portion, whereby the center zone of said connecting portion is laterally offset from the center plane of said casing toward said other side annular portion.

3,946,785

SIMPLIFIED BEAD CONSTRUCTION FOR PNEUMATIC TIRES

Robert Pope Powers, and James Dennis Gardner, both of Akron, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Aug. 1, 1974, Ser. No. 494,018

Int. Cl.² B60C *15/00*

U.S. Cl. 152—354 **10 Claims**

1. A radial ply pneumatic tire having an annular road-engaging tread surface reinforced with a tread ply belt, sidewalls extending from the sides of said tread surface and terminating in annular bead bundles, said tire having at least one body ply of radially extending, parallel, inextensible, reinforcing cords extending from one said bead bundle to the other, each said bead bundle having at least one bead connector ply wrapped around it, said bead connector ply having radially extending, parallel, inextensible, reinforcing cords with its ends in the lower sidewall area of said tire, the ends of said body ply terminating near said bead bundles in the bead areas on the same axial side of both ends of said bead connector ply

and on the same axial side as said body ply, each said end of said body ply being continuous with only one bead connector ply, said bead connector ply and said body ply being contiguous for a sufficient radial distance so that the inextensible

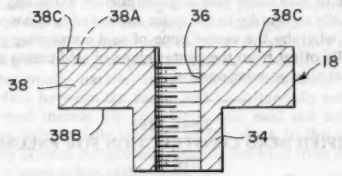
cords of said bead connector ply and said body ply effectively contact one another to equally distribute the shear over said contiguous length to give the tire a strong construction without said body ply ends being wrapped around said bead bundles and said bead connector ply.

3,946,786

TIRE CHANGING MACHINE IMPROVEMENT

Michael Musto, Maplewood, N.J., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Oct. 17, 1974, Ser. No. 501,989
Int. Cl.² B60C *25/08*
U.S. Cl. 157—1.24 **3 Claims**



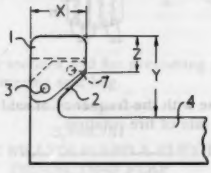
1. In a device for changing a tire on a wheel, said device including a platform for support of said wheel, a threaded spindle upstanding from said platform for passage through the center of said wheel and powered means for vertically moving the spindle relative to the platform, the improved wheel hold down device comprising: a unitary body including a downwardly projecting tubular sleeve having a cylindrical outside diameter dimensioned for loose fitting engagement in the center of said wheel, an internally threaded inside diameter for engagement on said spindle and flange extending radially outwardly from an upper end of said sleeve, said flange having a bottom surface for engagement against said wheel, said bottom surface being planar at an intersection with the cylindrical exterior of said sleeve.

3,946,787

APPARATUS FOR USE IN REMOVING TIRES FROM AND MOUNTING TIRES ON WHEEL RIMS

Derek Hogg, Sutton Coldfield, England, assignor to Dunlop Limited, London, England

Continuation of Ser. No. 251,084, May 8, 1972, abandoned. This application Nov. 18, 1974, Ser. No. 524,748
Claims priority, application United Kingdom, May 12, 1971, 14605/71
Int. Cl.² B60C *25/08*
U.S. Cl. 157—1.24 **9 Claims**



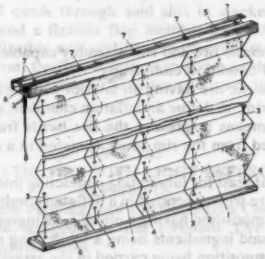
1. Apparatus for use in removing tires from and mounting tires on wheel rims including a wheel supporting means for a wheel rim comprising gripping means for gripping a wheel rim flange, said gripping means having a plurality of arms, each arm having a claw for engaging said rim flange and extension block means projecting outwardly above said claw for engaging at least part of the adjacent bead and lower sidewall of a tire on a wheel rim, and supporting the whole of the adjacent bead a distance from the flange sufficient to ensure that while the tire is being removed from the wheel no part of the lower tire bead falls back into engagement with its bead seat when the rim is engaged by said gripping means.

3,946,788

FOLDABLE CURTAIN SCREEN OR BLIND CONSTRUCTION AND A METHOD FOR PRODUCING A CURTAIN BLIND CONSTRUCTION

Hendrik van Muyen, Sliedrecht, Netherlands, assignor to Blydenstein-Willink N.V., Enschede, Netherlands

Filed June 28, 1974, Ser. No. 484,061
Int. Cl.² E06B *9/26*
U.S. Cl. 160—84 R **8 Claims**



1. A foldable curtain including a fixed upper rail, a movable lower rail, a plurality of flexible vertical cords extending vertically between said rails and guidably associated with said upper rail to permit the lifting of said lower rail when said cords are pulled and a plurality of vertical web sections extending between said rails, said web sections being horizontally reversely folded and having overlapping lateral margins provided with aligned holes receiving at least one of said cords whereby a curtain of a desired width may be constructed from a plurality of overlapping web sections which are selected

from web sections of one or more standard widths, said cord extending through said aligned holes to prevent horizontal separating movement of the web sections.

3,946,789
SLATTED CURTAIN

Roswitha Ronkholz-Tölle, nee Tolle, Drakestrasse 4, Dusseldorf, Germany

Filed Aug. 2, 1974, Ser. No. 494,335
Claims priority, application Germany, Aug. 6, 1973, 2339699
Int. Cl.² E06B 9/26
U.S. Cl. 160—166 A 10 Claims

1. A decorative window curtain assembly featuring angularly adjustable louver slats of drapable material for the achievement of a variety of different decorative and translucency effects, the curtain assembly comprising in combination:

a series of parallel regularly spaced slats of substantially opaque quality arranged to serve as louvers;

means for rotatably mounting said opaque slats ao as to admit light therebetween when they are oriented perpendicularly to the general plane of the curtain assembly and to progressively shut out the light, as they are re-oriented at a decreasing angle to said plane; and

a series of linking slats of substantially translucent quality occupying the spaces between said opaque slats, without substantially affecting the light-controlling action of the latter; the translucent slats being longitudinally connected to the opaque slats, so as to form a continuous assembly of alternatingly opaque and translucent slats in the direction transverse to the extent of the slats; and wherein

said continuous assembly of alternatingly opaque and translucent slats is constituted by a continuous web of said drapable material extending in said transverse direction, whereby single-layer web sections alternate with double-layer, tubular web sections of at least equal web length, the former serving as said translucent linking slats, while the latter, transversely flattened so as to leave a minimum interval in the web direction between successive single-layer sections, serve as said opaque slats; and

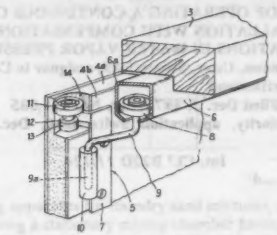
the opaque slats further include slat shaping means holding their constituent double-layer web sections in the aforementioned transversely flattened shape and giving them the character and appearance of louver slats, by stiffening at least their edge portions, thereby creating an H-shaped cross-sectional curtain configuration, two adjacent opaque slats forming the two legs of the H-shape, and the intermediate linking translucent slat forming its cross bar.

3,946,790
GUIDANCE ARRANGEMENT FOR OPENING AND CLOSING PANELS ARTICULATED RELATIVE TO EACH OTHER AND RELATIVE TO A STATIONARY FRAME

Pierre Besse, Route de la Montzie Cap Blanc, Perigueux, Dordogne, France

Filed May 2, 1973, Ser. No. 356,335
Int. Cl.² E02D 15/26
U.S. Cl. 160—206 7 Claims

1. In a door assembly of the type comprising a stationary frame including two vertical members connected at their upper ends by a transverse horizontal member, the horizontal member being interiorly defined by a vertical face, a closure assembly including a set of two rigid panels, to wit an inner panel and an outer panel, said panels having interior faces, said inner panel being pivoted to one of said vertical members by a first hinge means and said outer panel being pivoted to the inner panel by a second hinge means so that the panels are parallel to the plane of the frame when closed and perpendicular to that plane when open, and a guidance arrangement including an integral crank and a downwardly opened, inverted U-shaped channel secured laterally to said transverse horizontal member exteriorly from the vertical face to define a space between the channel and the said vertical face and provided with a substantially unobstructed vertical surface facing the closure assembly, said crank being formed with an



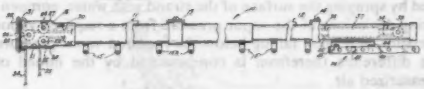
horizontal intermediate portion and with two vertical end portions, to wit an upper end portion and a lower end-portion, the lower end-portion being pivoted in a support plate secured to the outer panel adjacent the top of its vertical edge remote from the second hinge means and the upper end-portion extending into said channel and rotatably mounting a first guiding roller within said channel;

the improvement which comprises the support plate independently rotatably carrying a second guiding roller, said roller adapted to engage said vertical surface of the channel, said second roller being positioned within the space defined between the channel and the vertical face, and means to position the interior faces of the panels in substantially co-planar relationship with the vertical face.

3,946,791
REVERSIBLE ONE WAY DRAW CURTAIN ROD

David L. Brown, 3312 W. 14th Ave., Eugene, Oreg. 97402

Filed Sept. 20, 1974, Ser. No. 507,815
Int. Cl.² A47H 5/032
U.S. Cl. 160—345 3 Claims



1. A reversible one way draw curtain rod assembly enabling the draw cords to be located at either side of a curtained window upon relocation of a wall mounted bracket and rod holder without curtain rod disassembly, said curtain rod assembly comprising,

a one way curtain rod with curtain supporting slides, said rod supported at one of its ends by a holder and at points therealong,

a pulley assembly affixed to the supported end of the curtain rod and projecting outwardly therefrom, said pulley assembly including three pulley members, at least two pulley members at all times supporting a pair of entrained draw cords, the remaining pulley member serving to receive one of the cords upon the rod being turned end-for-end in an upright path during reversing the curtain rod, and

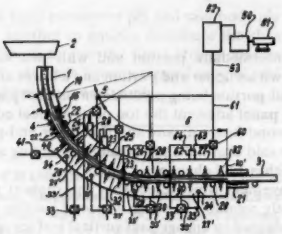
a master carrier assembly comprising,
a slide member slidably disposed within said curtain rod for travel lengthwise of the curtain rod in response to curtain cord movement,
a carrier plate,
a curtain bar pivotally attached to said carrier plate,
means detachably supporting said carrier plate on said slide member permitting removal of said carrier plate from the slide member and subsequent reinstallation thereon upon inversion of the curtain rod so as to relocate said curtain bar in substantial alignment with the curtain slides on the rod.

3,946,792

METHOD OF OPERATING A CONTINUOUS CASTING INSTALLATION WITH COMPENSATION OF DEVIATIONS IN WATER VAPOR PRESSURE

Armin Thalmann, Uster, Switzerland, assignor to Concast AG, Zurich, Switzerland

Filed Dec. 3, 1973, Ser. No. 421,085
Claims priority, application Switzerland, Dec. 5, 1972, 17771/72
Int. Cl.[2] B22D *11/124*
U.S. Cl. 164—4 **5 Claims**



1. A method of operating a continuous casting installation with high throughput, wherein the steel is cast into a cooled mold, the strand which is formed in the mold possessing a liquid core and such strand is withdrawn from the mold, guided and cooled, the improvement comprising the steps of: subjecting the surface of the strand to the action of a pressurized gaseous medium, primarily in the form of water vapor, at least at a partial region between the mold and the point of complete solidification of the strand, the pressure of the gaseous medium essentially corresponding to the ferrostatic pressure prevailing at the cast strand, the water vapor being generated by spraying the surface of the strand with water, compensating deviations of the vapor pressure from a required vapor pressure, and upon falling below the required vapor pressure the difference therefrom is compensated by the infeed of pressurized air.

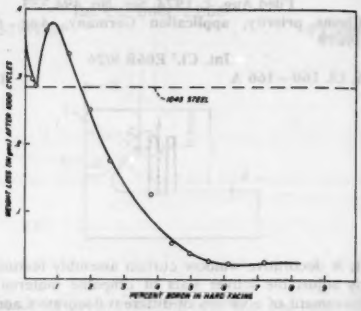
3,946,793

METHOD OF FORMING A HIGH-TEMPERATURE ABRASION-RESISTANT COATING ON A FERROUS METAL SUBSTRATE

Robert H. Kachik, Washington Township, Westmoreland County, and Arthur J. Pignocco, Franklin Township, Westmoreland County, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 332,987, Feb. 15, 1973, abandoned. This application Sept. 9, 1974, Ser. No. 504,207
Int. Cl.[2] B23K *23/00*
U.S. Cl. 164—54 **24 Claims**

10. A method of making a ferrous metal article having a hard facing resistant to abrasion at high temperatures comprising:
forming a ferrous metal substrate of any desired configuration;
positioning a refractory perimeter around the portion of the substrate to be hard faced;
placing an exothermic reaction mixture within the perimeter to a generally uniform depth of at least about ½ inch, said charge consisting essentially of



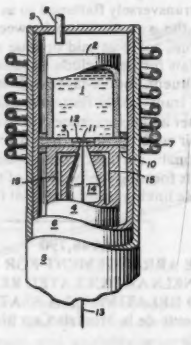
65 to 85 parts iron oxide powder,
15 to 35 parts fuel powder, and
sufficient ferroboron to provide from 1½ to 8 weight percent boron in the hard facing composition;
igniting the charge to set off an exothermic reduction reaction, allowing the metal to form a tightly adherent alloy metallurgically bonded to the substrate and a brittle slag layer thereon,
cooling the product, and
removing the perimeter.

3,946,794

METHOD FOR PRODUCING FINE DIAMETER WIRE FROM STEEL-TITANIUM MELTS

Lawrence F. Rakestraw, Raleigh, N.C., assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 29, 1973, Ser. No. 392,601
Int. Cl. B22d *11/10*
U.S. Cl. 164—82 **8 Claims**



1. In a method for producing fine diameter wire from the melt of a steel alloy wherein said melt is extruded through an orifice as a continuous molten stream and into an oxygen-containing atmosphere where a stabilizing film is caused to form about the surface of the stream to preserve its continuity until solidified, the improvement which comprises:

a. heating to the melt an alloy comprised of steel and at least 0.2 percent by weight of titanium;
b. maintaining a pressurized gas mixture over the melt consisting of an inert gas and an oxygen-containing gas;
c. controlling the oxygen potential of the melt by means of said oxygen-containing gas at a level wherein the titania formed in the melt by oxidization of said titanium has an activity of from about 0.3 to unity;
d. causing said melt to extrude through an orifice as a continuous molten stream and into an oxygen-containing gaseous atmosphere having the capacity for increasing the oxygen potential of said stream to a level wherein said titania is caused to precipitate and form a stabilizing film about the periphery of said stream;
e. cooling said film-stabilized molten stream to the solid state.

3,946,795

METHOD AND APPARATUS FOR REGULATING THE MOLTEN METAL LEVEL IN A MOLD OF A CONTINUOUS CASTING INSTALLATION

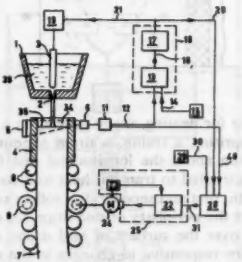
Werner Bruderer, Feldmeilen, Switzerland, and Hans Thiemann, Dusseldorf, Germany, assignors to Schloemann Aktiengesellschaft, Dusseldorf, Germany and Concast AG, Zurich, Switzerland

Filed Oct. 12, 1973, Ser. No. 405,761

Claims priority, application Switzerland, Oct. 17, 1972, 15186/72

Int. Cl.² B22C *19/04*; B22D *11/16*

U.S. Cl. 164—154 **5 Claims**



1. A method of regulating the level of molten metal in a continuous casting mold of a continuous casting installation, wherein deviations in the level of the molten metal in the continuous casting mold, as determined by measuring such level, from a reference value are eliminated by regulating either the inflow of metal to the mold, the withdrawal speed of the strand from the mold, or both the inflow of metal to the mold and the withdrawal speed of the strand from the mold, the improvement comprising the steps of generating a signal indicative of deviations from said reference value, generating adjustment magnitudes at a metal inflow regulation circuit in response to said signal, delivering such adjustment magnitudes to a strand withdrawal regulation circuit, altering a preset reference value of the strand withdrawal regulation in dependency of such adjustment magnitudes according to a preset function, and presetting said function such that the reference value of the strand withdrawal regulation is only then influenced when the change in the adjustment magnitude in the metal inflow regulation circuit per unit of time exceeds a preset value.

3,946,796

APPARATUS FOR MAKING SAND-RESIN MOLDS

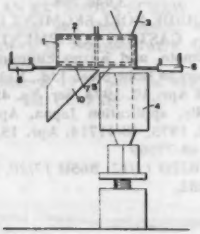
William McCormack, Studley, England, assignor to British Cast Iron Research Association, Birmingham, England

Filed June 27, 1974, Ser. No. 483,769

Claims priority, application United Kingdom, June 28, 1973, 30942/73

Int. Cl.² B22C *15/00*

U.S. Cl. 164—200 **4 Claims**



1. Mixing apparatus for foundry sand mixtures, said apparatus comprising a stationary mixing chamber having in its floor an opening extending across the full width of the floor, a rotary mechanical mixer within said chamber, first and second separate shutters each capable of separate movement horizontally across the opening from opposite sides and adapted to come into mutual contact to close the opening, said shutters controlling associated opening portions, a foundry core-making or mould-making machine having an inlet placed to receive material from the opening portion covered by said first shutter and a waste chute having an inlet placed to receive material from the opening portion covered by said second shutter.

3,946,797

ARRANGEMENT FOR COOLING AND SUPPORTING A CONTINUOUSLY CAST METAL STRAND

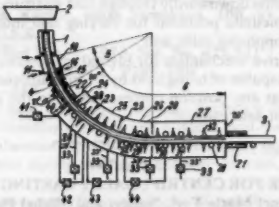
Armin Thalmann, Uster, Switzerland, assignor to Concast AG, Zurich, Switzerland

Filed Dec. 3, 1973, Ser. No. 421,084

Claims priority, application Switzerland, Dec. 5, 1972, 17770/72

Int. Cl.² B22D *11/124*

U.S. Cl. 164—282 **4 Claims**



1. A continuous casting installation for the continuous casting of metals, especially steel, comprising a cooled mold for continuously casting a strand, a casting vessel for delivering the metal to be cast into the mold, a strand guide assembly incorporating a first partial region and a second partial region, the first partial region of the strand guide assembly directly following the mold and terminating at a location prior to solidification of the strand, said first partial region comprising guide elements for contacting areas of the surface of the cast strand which are supported thereby and means for directly

cooling the strand with a cooling agent, the second partial region incorporating a closed compartment which is under pressure, said closed compartment having opposed ends, said opposed ends being provided with means for sealing the throughpassage strand, rollers arranged within such compartment for guiding the strand along a predetermined path of travel, means for conveying the strand and means for the infeed of cooling agent.

3,946,798

CAST PIECE GUIDE ROLL SEGMENT IN CONTINUOUS CASTING EQUIPMENT

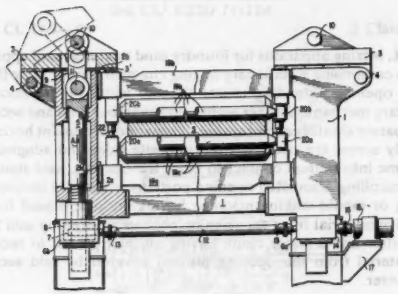
Yoshikazu Uchimoto, and Kazuo Fujimura, both of Kobe, Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Filed Apr. 10, 1974, Ser. No. 459,581

Claims priority, application Japan, Apr. 10, 1973, 48-40583; Apr. 12, 1973, 48-41714; Apr. 15, 1973, 48-42864; June 27, 1973, 48-77069

Int. Cl.² B22D *11/12;* **B65H** *17/20;* **G03B** *1/54*

U.S. Cl. 164—282 **4 Claims**



1. A cast piece guid roll segment in continuous casting equipment comprising:

roll units rotatably supporting at least a pair of rolls with the interval between opposing rolls being variable;

a frame having an aperture defined on the top thereof for removal and insertion of said roll units;

caps pivotably mounted on said frame and movable between a first position, at which said aperture is entirely uncovered and opened so as to permit said removal and insertion of said roll units through said aperture, and a second position, at which said aperture is covered so as to prevent the removal of said roll units and to press said roll units downwardly through said aperture, and through intermediate positions for varying said interval between said opposing rolls; and

a cap drive mechanism for pivotal movement of said caps, and capable of being held by a force sufficient to hold the rolls at any position corresponding to the pivoting position of said caps.

3,946,799

MACHINE FOR CENTRIFUGALLY CASTING IRON PIPES

Pierre Henri Marie Fort, Nancy, and Michel Pierrel, Pont-a-Mousson,, France, assignors to Pont-a-Mousson S.A., Nancy, France

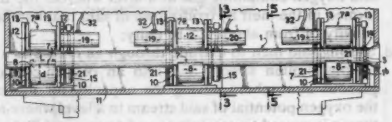
Filed Apr. 1, 1975, Ser. No. 563,989

Claims priority, application France, Apr. 3, 1974, 74.11792

Int. Cl.² B22D *13/02*

U.S. Cl. 164—286 **11 Claims**

1. A machine for centrifugally casting iron pipes comprising a rotary casting mould, a plurality of maintaining devices for maintaining the mould, each device comprising sets of rollers, each set comprising at least three rollers which are coplanar and arranged around a region of the mould, namely two lower support rollers and an upper pressing roller, a pivotal arm carrying the pressing roller, the pressing roller of each set of rollers being a driving roller and the rollers of each set having



a diameter at least equal to the diameter of the mould in the corresponding region of the mould and an axial length at least equal to the diameter of the rollers.

3,946,800

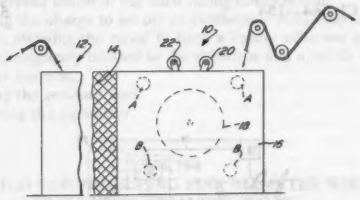
PREHEATER AND METHOD OF CONTROLLING WRAP OF A WEB

Donald J. Evans, Cherry Hill, N.J., assignor to Molins Machine Company, Inc., Camden, N.J.

Continuation-in-part of Ser. No. 373,720, June 26, 1973, abandoned. This application Sept. 26, 1974, Ser. No. 509,627

Int. Cl.² F28D *11/02*

U.S. Cl. 165—1 **10 Claims**



1. A preheater for heating a web moving in a paperboard corrugator comprising a frame, a drum supported by said frame for rotation about the longitudinal axis thereof, said drum being constructed to transmit heat to a web in surface contact therewith, first and second idler rollers supported for movement about the periphery of said drum for effecting the wrap of a web over the surface of said drum, drive means including a motor responsive to changes in the speed of the web in the corrugator for causing said first and second idler rollers to move between a minimum wrap position and a maximum wrap position as the speed of the web varies from a minimum to a maximum.

3,946,801

RECUPERATOR

Richard L. Brunell, Scio, and Jerry J. Wright, Wellsville, both of N.Y., assignors to The Air Preheater Company, Inc., Wellsville, N.Y.

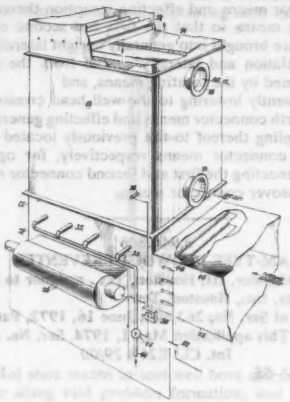
Filed Aug. 8, 1974, Ser. No. 495,610

Int. Cl.² F02C *7/08, 7/32, 7/34*

U.S. Cl. 165—32 **3 Claims**

1. Heat exchange apparatus that provides supplemental heating of the heat exchange structure including means that retard a change of temperature to obviate thermal shock thereof comprising in combination a housing having an inlet and an outlet for a heating fluid, inlet and outlet ducts in said housing that direct a fluid to be heated in heat exchange relation with the heating fluid, auxiliary heat generating means connected to the inlet for the heating fluid, means responsive to the temperature of the heating fluid, and means responsive

to said temperature responsive means controlling the auxiliary heat generating means whereby the auxiliary heat generating



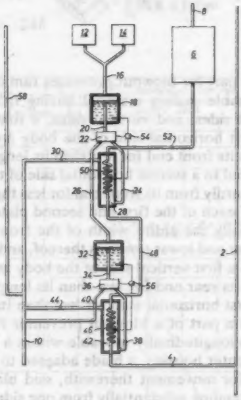
means varies in accordance with the temperature of the heating fluid.

3,946,802

METHOD AND APPARATUS FOR HEAT RECOVERY

Rune Christenson, Varbacken 1, 13100 Nacka, Sweden

Filed Oct. 8, 1974, Ser. No. 513,031
Claims priority, application Sweden, Oct. 9, 1973, 7313697
Int. Cl.² G05D *23/00*
U.S. Cl. 165—35 **5 Claims**



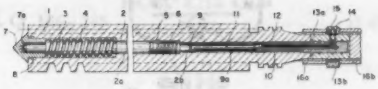
1. Apparatus for recovering heat in water and waste pipe systems, comprising a main supply pipe for cold water, a water heater supplied with water from said supply pipe, a waste pipe which is supplied with waste water from different consumption points and a heat exchanger which is connected with the waste water pipe and is connected between said supply pipe for cold water and the water heater for providing a preheating of the cold water by means of the waste water before the cold water is supplied to the water heater, wherein the apparatus is provided with a branching point before the heat exchanger, from which a first pipe extends to the heat exchanger and a second pipe extends past the heat exchanger and the apparatus comprises a detector and control device for determining the relationship between the temperature of the waste water escaping from said consumption points upstream from the branching point and the temperature of the waste water in the heat exchanger and for directing the escaping waste water to the heat exchanger if the temperature of the waste water therein is lower than the temperature of the escaping waste water and in the opposite case directing the escaping waste water past the heat exchanger.

3,946,803

APPARATUS FOR CONTROLLING TEMPERATURE OF AN EXTRUDER SCREW

Robert Heitzer, Bogen, and Peter Klenk, Munich, both of Germany, assignors to Kunststoffwerk Gebruder Anger GmbH & Co., Munich, Germany

Filed Mar. 8, 1974, Ser. No. 449,499
Int. Cl.² F28F *5/06*
U.S. Cl. 165—87 **7 Claims**



1. In an extruder screw having an axial bore therein and said axial bore having tip and rear ends, the combination of a first cooling medium substantially throughout the length of said bore to define a closed temperature control system to cool the length of the extruder screw, a heat exchanger extending into said axial bore from said rear end thereof and extending a portion of the length of said bore such that the first cooling medium flows in heat exchange relationship with said heat exchanger, means for circulating from an external source a second cooling medium through said heat exchanger independently of said first cooling medium whereby heat energy is transmitted from said first cooling medium to said second cooling medium, means within said bore for conveying the first cooling medium from the area of the heat exchanger toward the tip end of the bore, means for closing hermetically said axial bore at both ends thereof and means for metering the quantity of second cooling medium circulated so that the closed system is controlled by said heat exchanger.

3,946,804

PLATE HEAT EXCHANGER

Grigory Anatolievich Tkach, ulitsa Frunze, 15, kv. 8; Vsevolod Dmitrievich Smolyak, ulitsa Sumskaya, 106, kv. 12; Vitaly Moiseevich Frumin, 605 mikroraion, 22, kv. 5, and Anatoly Grigorievich Klimor, ulitsa Sumskaya, 100, kv. 9, all of Kharkov, U.S.S.R.

Filed Dec. 7, 1973, Ser. No. 422,921
Int. Cl.² F28F *3/08*
U.S. Cl. 165—167 **7 Claims**

1. A plate heat exchanger for heat exchange between a gaseous heat-transfer medium and a liquid heat-transfer medium which liberates a gas that rises through the liquid in the form of bubbles during the heat exchange process, comprising:

a. at least two superimposed stacks of parallel, vertically disposed heat-exchanging plates;

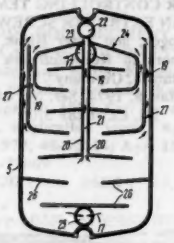
b. peripheral sealing means for sealing together alternate pairs of plates within each said stack to form chambers adapted therein to direct the flow of the gas-liberating liquid heat-transfer medium, each pair of alternate pairs of thus sealed plates defining therebetween a channel for the passage of a gaseous heat-transfer medium;

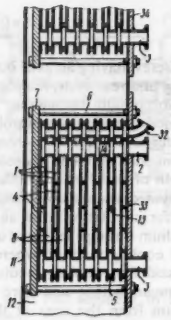
c. means for separately feeding the liquid heat-transfer medium into the upper portion of each of said chambers;

d. means for separately discharging the liquid heat-transfer medium from the lower portion of each of said chambers;

e. exhaust conduits connected to said chambers for discharging the gas which has been liberated from the liquid heat-transfer medium therein;

f. partitions within each of said chambers carried by one of the plates forming the respective chambers for directing the liberated gas therein to the exhaust conduit therefor, said partitions being so positioned that the rising bubbles of gas are directed away from the downward flow of the





liquid heat-transfer medium whereby intermixing of the gas with the liquid heat-transfer medium is prevented; and

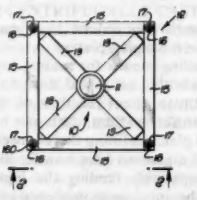
g. a hollow housing containing said stacked plates therein, the interior of said housing being in direct communication with said channels for unidirectional straight-through passage of the gaseous heat-transfer medium through said channels.

3,946,805

UNDERWATER CONNECTIONS AT WELL HEAD LOCATIONS

Charles P. Peterman, South Laguna, Calif., assignor to Hydril Company, Los Angeles, Calif.

Filed Apr. 8, 1974, Ser. No. 458,648
Int. Cl.² E21B 7/12
U.S. Cl. 166—.6 **21 Claims**



1. In the method of controlling a stack of underwater well head equipment, and wherein a locating means is preliminarily positioned at the well head, the steps that include

a. separately lowering to the well head first and second connector means and effecting reception thereof by the locating means so that the first and second connector means are brought into generally upright laterally spaced apart relation and laterally spaced from the stack, as determined by the locating means, and

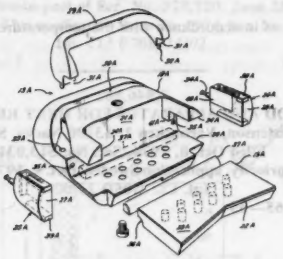
b. subsequently lowering to the well head crossover third and fourth connector means and effecting generally vertical coupling thereof to the previously located first and second connector means respectively, for operatively interconnecting the first and second connector means via the crossover connector means.

3,946,806

RAM-TYPE BLOWOUT PREVENTER

Maurice J. Meynier, III, Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.

Division of Ser. No. 263,602, June 16, 1972, Pat. No. 3,817,326. This application May 1, 1974, Ser. No. 466,049
Int. Cl.² E21B 29/00
U.S. Cl. 166—55 **14 Claims**



1. A side seal part for blowout preventer ram comprising a body of deformable sealing material having front and rear ends, horizontal sides, and vertical sides, a first rigid plate secured to a first horizontal side of the body and extending rearwardly from its front end for less than its length, a second rigid plate secured to a second horizontal side of the body and extending rearwardly from its front end for less than its length, the front end of each of the first and second plates extending across substantially the entire width of the front end of the body at the upper and lower portions thereof, and a third rigid plate secured to a first vertical side of the body and extending forwardly from its rear end for less than its length and vertically from its first horizontal side for less than its height.

5. For use as a part of a blowout preventer ram having a carrier which is longitudinally movable within a guideway of a blowout preventer housing, a blade adapted to be mounted on the carrier for movement therewith, said blade having a cutting edge extending substantially from one side to the other thereof, a surface extending from said edge, and a groove in the surface extending from one side to the other thereof, and a sealing member in said groove.

3,946,807

WELL TOOLS

Amareswar Amancharla, Dallas, and Carter R. Young, Lewisville, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Dec. 18, 1974, Ser. No. 533,935
Int. Cl.² E21B 23/00, 43/10
U.S. Cl. 166—123 **10 Claims**

1. Apparatus for precompletion of a well bore through a problem formation comprising: expendable plug means releasably connectible in said well bore above said problem forma-

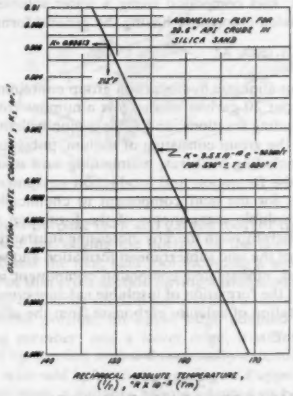
tion; expending shoe means for engaging and forcing said plug means downwardly in said well bore and supporting said plug means in said well bore; well liner means connectible at a first lower end thereof with said expending shoe means for supporting said shoe means in said well bore and for lining said well bore along said problem formation; and liner hanger means connectible with an opposite upper end of said well liner means for supporting said well liner means in said well bore along said problem formation.

3,946,808

PROCESS FOR RECOVERING HYDROCARBONS FROM A SUBTERRANEAN RESERVOIR BY IN SITU COMBUSTION

Issam S. Bousaid, and Marc F. Fontaine, both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Feb. 1, 1974, Ser. No. 438,803
Int. Cl.² E21B *43/24*
U.S. Cl. 166—245 **6 Claims**


ARRHENIUS PLOT FOR 30.6° API CRUDE IN SILICA SAND
215°F
OXIDATION RATE CONSTANT, K_2, hr^{-1}
RECIPROCAL ABSOLUTE TEMPERATURE, $(1/T)$, $^\circ R^{-1}$ $(1/m)$

1. A method for producing hydrocarbons from an underground hydrocarbon-bearing formation involving injection wells and production wells wherein a combustion supporting gas is introduced into the injection wells and the hydrocarbons are ignited in situ around the injection wells in order to propagate a combustion front radiating from the injection wells so that hot gases are generated to force hydrocarbons to the production wells the improvement which comprises

determining the distance at which the flux of the combustion supporting gas becomes negligible by the formula

$$r_f = \left[\frac{V_i \ln (21/\%O_2)}{48 \pi h \phi K} \right]^{1/2}$$

wherein

V_i = air injection rate in SCF/day
h = sand formation thickness, Feet
ϕ = formation porosity, fraction of rock volume
K = oxidation rate constant, hr^{-1} and

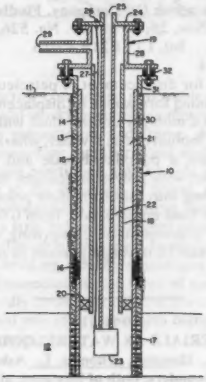
placing production wells at said distance r_f from said injection wells.

3,946,809

OIL RECOVERY BY COMBINATION STEAM STIMULATION AND ELECTRICAL HEATING

Alton R. Hagedorn, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Dec. 19, 1974, Ser. No. 534,261
Int. Cl.² E21B *43/24*
U.S. Cl. 166—248 **11 Claims**



1. A method for recovering oil from a subterranean formation containing oil and connate water and penetrated by a plurality of wells which comprises injecting steam into said formation at each of said wells to heat said formation and said oil contained in said formation, withdrawing heated oil from said formation by means of the same said wells and thereby decreasing the oil saturation in the steam heated portion of said formation and increasing the water saturation within said heated portion of said formation, injecting an electrically conductive fluid into said formation at a volume sufficient to occupy at least a part of the portion of the formation heated by said steam, passing an electrical current between said wells to further heat said formation and said oil contained in said formation, and withdrawing oil from said formation.

3,946,810

IN SITU RECOVERY OF HYDROCARBONS FROM TAR SANDS

Charles B. Barry, Houston, Tex., assignor to The Ralph M. Parsons Company, Pasadena, Calif.

Division of Ser. No. 363,596, May 24, 1973, Pat. No. 3,881,550. This application Nov. 7, 1974, Ser. No. 521,552
Int. Cl.² E21B *43/16*
U.S. Cl. 166—272 **10 Claims**

1. In a process for recovering hydrocarbons from a subterranean deposit of hydrocarbons having high viscosities including tar sands, oil and tar deposits by stimulating the deposit through the injection of fluid, an improvement which comprises:

a. simultaneously injecting steam and a solvent of high aromatic content produced from the hydrocarbon deposit;
b. carrying the solvent by the steam into the deposit;
c. heating the hydrocarbon in the deposit by the steam and solvent to thereby decrease its viscosity;
d. thermally expanding the deposit by the steam and solvent to release hydrocarbons therefrom;
e. breaking viscous emulsions by the solvent;
f. dissolving contained waxes and asphaltenes by the solvent;
g. cutting heavy hydrocarbons by the solvent; and
h. recovering hydrocarbons from the deposit at least in part by a pressure drive of the injected steam and solvent and producing from the recovered hydrocarbon a solvent of high aromatic content for reintroduction with steam into the deposit.

3,946,811

POLYALKENE OXIDE PRESLUG FOR PROTECTING DISPLACEMENT FLUIDS FROM POLYVALENT IONS

Charles J. Norton, and David O. Falk, both of Denver, Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Nov. 25, 1974, Ser. No. 526,552
Int. Cl.² E21B *43/16*
U.S. Cl. 166—274 **10 Claims**

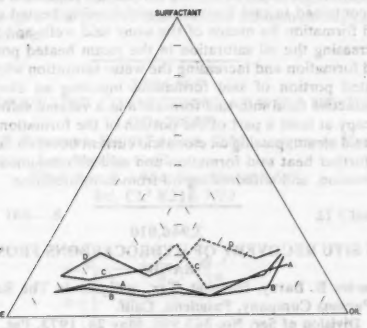
1. In processes for displacement of petroleum from polyvalent cation-containing formations by displacement fluids comprising water and a mobility control fluid which substantially decreases the the mobility of said water, wherein said mobility control fluid is not a polyalkeneoxide and is deleteriously affected by contact with polyvalent cation, the improvement comprising injecting into said formation prior to injection of said displacement fluid composition, from 0.01 to about 1.00 pore volumes of a composition comprising water and from about 0.001 to about 10.0 weight percent of polyalkene oxide polymer.

3,946,812

USE OF MATERIALS AS WATERFLOOD ADDITIVES

Walter W. Gale, Houston; Thomas L. Ashcraft, Jr., and Rhoderick K. Saunders, both of Baytown, all of Tex., assignors to Exxon Production Research Company, Houston, Tex.

Division of Ser. No. 430,330, Jan. 2, 1974. This application Mar. 12, 1975, Ser. No. 557,719
Int. Cl.² E21B *43/22*
U.S. Cl. 166—274 **6 Claims**



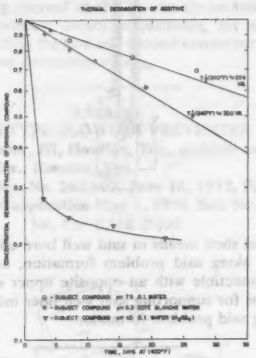
1. In a method of recovering crude oil from a subterranean formation by a waterflooding process, the improvement wherein the waterflood is preceded by injection into said formation of a slug of a transparent, aqueous solution of a water-soluble, sulfated, polyethoxylated alcohol, said aqueous solution being substantially free of any other thickening agent and any other surface active agent.

3,946,813

METHOD FOR STIMULATING WELL PRODUCTION

Jack F. Tate; Jim Maddox, Jr., and Russell D. Shupe, all of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 20, 1974, Ser. No. 534,958
Int. Cl.² E21B *43/26, 43/27*
U.S. Cl. 166—307 **13 Claims**



1. A method of increasing the production of fluids from a subterranean fluid-bearing formation having present therein acid-soluble components comprising injecting down the well bore penetrating said formation and injecting therefrom into said formation under a pressure greater than the formation pressure, an aqueous acidic solution containing from about 0.5 to about 28% by weight of a mineral acid having a compound therein in an amount of from about 0.005% to about 2% by weight, said compound being a water soluble sulfonated, ethoxylated compound having the general formula

$$R(OCH_2CH_2)_nSO_3^-A^+$$

wherein R is an aliphatic hydrocarbon group containing from about 8 to about 20 carbon atoms, n is a number from 1 to about 10, including fractions, and A^+ is a monovalent cation selected from the group consisting of sodium, potassium, and ammonium, including mixtures, maintaining said solution in contact with the formation and production equipment for a time sufficient for the acid component to chemically react with the acid-soluble components of the formation to etch passageways therethrough thereby increasing substantially the flow capacity of the said subterranean formation and whereby said sulfonated, ethoxylated compound component is effective to prevent the formation of insoluble calcium compounds or the precipitation of calcium carbonate from the acid-spent solution.

3,946,814

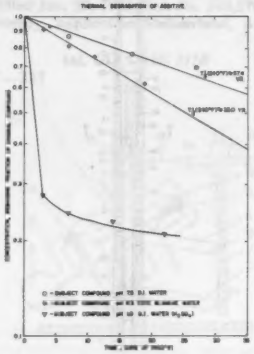
METHOD FOR OIL RECOVERY

Russell D. Shupe; Jim Maddox, Jr., and Jack F. Tate, all of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 20, 1974, Ser. No. 534,956
Int. Cl.² E21B *43/25, 43/26*
U.S. Cl. 166—308 **10 Claims**

1. Method of increasing and sustaining the production of fluids from a subterranean fluid-bearing formation comprising injecting down the well bore penetrating said formation and injecting therefrom into said formation under a pressure greater than the formation pressure, an aqueous solution consisting essentially of water and a water-soluble sulfonated, ethoxylated compound having the general formula

$R(OCH_2CH_2)_nSO_3^-A^+$



wherein R is an aliphatic hydrocarbon group containing from about 8 to about 20 carbon atoms, *n* is a number from 1 to about 10, including fractions, and A^+ is a monovalent cation selected from the group consisting of sodium, potassium, and ammonium, including mixtures.

3,946,815

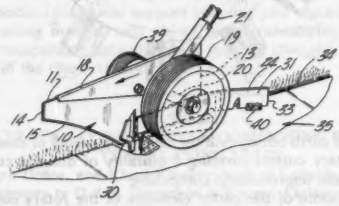
LAWN EDGING AND SOD CUTTING DEVICE

Marko Ajdukovic, 26536 Woodingham, Warren, Mich. 48091

Filed Mar. 12, 1975, Ser. No. 557,607

Int. Cl.² A01B *45/04*

U.S. Cl. 172—17 **6 Claims**



1. A dual-purpose lawn and garden tool for the purposes of cutting sod and edging the portion of the lawn adjacent the sidewalk and the like, said tool including a structural frame member of thin cross section having a sharpened leading edge consisting of a short vertical portion and a rearwardly extending concave portion, an upper edge adapted to receive a stiffening member, and a lower edge, a stiffening member having a lip portion and a downwardly extending elongated portion, with said lip portion engaging said upper edge of said frame member, a suitable handle adapted to be attached to said frame member through said stiffening member, a plurality of fastening means to attach said handle to said frame member through said stiffening means, an axle attached to said frame member through said stiffening member ahead of any of said fastening means, a small support wheel removably mounted to said axle, and wherein one of said fastening means is located proximate the lower extremity of said handle, and has an axle-like portion extending parallel to said axle, but in the opposite direction, and including a second larger lawn edging wheel rotatably mounted on said axle-like portion for support of said structural member only, but adapted to be easily removed therefrom when desired.

3,946,816

ROTARY HARROWS

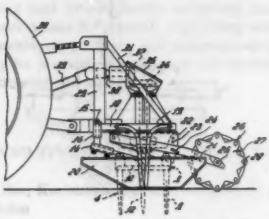
Ary van der Lely, 10 Weverskade, Maasland, and Cornelis Johannes Gerardus Bom, 36 Esdoornlaan, Rozenburg, both of Netherlands

Continuation of Ser. No. 338,606, March 6, 1973, abandoned. This application Nov. 4, 1974, Ser. No. 520,809

Claims priority, application Netherlands, Mar. 8, 1972, 7203041

Int. Cl.² A01B *9/00, 33/06*

U.S. Cl. 172—65 **26 Claims**



1. A rotary harrow comprising a movable frame and a plurality of rotary soil-working members mounted on upwardly extending shafts supports on said frame, driving means for rotating said soil-working members, said shafts and soil-working members being positioned side by side in a row that extends transverse to the direction of travel, said soil-working members being substantially spaced from one another to work paths and leave a strip between adjacent paths in the soil, non rotary further soil-working members positioned between adjacent rotary soil-working members, said non rotary members being pivotally connected to the front of said frame and extending downwardly to the rear to work the strips between the worked paths, said non rotary members being movable to and fro through the strips.

3,946,817

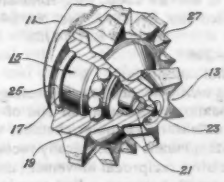
DIFFERENTIALLY CARBURIZED ROCK BIT CUTTER

Richard B. Prince, Houston, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed Dec. 23, 1974, Ser. No. 535,871

Int. Cl.² E21B *9/35*

U.S. Cl. 175—374 **8 Claims**



1. In an earth boring bit, an improved rotatable cutter comprising:

a first carburized case on the cutter exterior;

a second carburized case on the cutter interior;

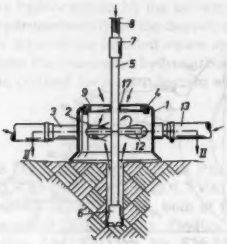
said second case having a substantially higher carbon content at its surface than said first case;

said first and second carburized cases being hardened to produce a cutter with an interior substantially harder than the exterior, providing a cutter resistant to tooth breakage while maintaining a wear resistant bearing surface.

3,946,818
DUST CONTROLLING DEVICE FOR ROCK DRILLING

Klas Goran Gunnarsson Ek, Tyreso, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Jan. 21, 1974, Ser. No. 435,290
Claims priority, application Sweden, Feb. 1, 1973, 7301390
Int. Cl.² E21C 7/02
U.S. Cl. 175—209 12 Claims



1. In a dust guard for preventing free escape of drill dust from a drill hole during air-flushed rock drilling, comprising a drill stem surrounding shell (1) provided with an outlet opening (2) and a drill stem opening (4), the drill stem opening (4) being lined with a flexible collar (9),

the improvement wherein:

said flexible collar (9) comprises an outer ring (14) and a plurality of resilient tongues (15) extending radially, inwardly from said outer ring (14) leaving a central opening (17) for a drill stem (5), each of said tongues (15) having a width substantially greater than the thickness thereof and having at least a portion which is inclined relative to a plane in which said flexible collar (9) lies, at least adjacent ones of said tongues (15) commonly extending from the same outer ring (14) overlapping each other so as to prevent free passing of dust particles out of said shell between the drill stem (5) and said flexible collar (9) and between said adjacent tongues (15).

3,946,819
WELL TOOL AND METHOD OF USE THEREFOR

James Edward Hipp, New Iberia, La., assignor to Brown Equipment & Service Tools, Inc., Houston, Tex.

Filed Jan. 27, 1975, Ser. No. 544,070
Int. Cl.² E21B 1/06
U.S. Cl. 175—296 17 Claims

1. A well tool comprising:

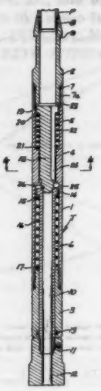
a. a housing having means for connecting said tool in fluid communication with the lower end of a pipe string and defining at least one annular chamber therein;

b. tubular stem means telescopically received by said housing for relative reciprocal movement and sealing engagement therewith between a first terminal position and a second terminal position in response to fluid pressure communicated to said housing through said pipe string;

c. a working member attached to one end of said stem means for said relative movement therewith between said first and second terminal positions;

d. valve means carried by said housing responsive to predetermined movement of said stem means, relative to said housing, to relieve said fluid pressure, permitting return of said stem means and housing to said first terminal position; and

e. biasing means disposed in said annular chamber biasing said stem member and housing toward said first terminal position and biasing said valve into a closed position when

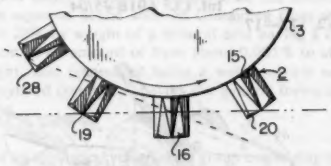


said stem member and housing are in said first terminal position.

3,946,820
NOVEL CUTTER ELEMENTS FOR DRILL BITS

Seth Raymond Knapp, Ardmore, Okla., assignor to Laurilda Ferne Knapp, Ardmore, Okla.

Filed Oct. 25, 1974, Ser. No. 517,875
Int. Cl.² E21B 9/10; E21C 13/00
U.S. Cl. 175—341 18 Claims



14. In an earth boring drill bit having a plurality of conical-shaped rotary cutters carrying a plurality of discrete cutter elements, the improvement comprising

at least some of the cutter elements of the rotary cutters being quadrilateral in plan,

each of said quadrilateral cutter elements including a pair of chisel-shaped teeth coextensive from crest to root and from the outer extremity to the base of said element,

the teeth being oriented diagonally of each quadrilateral cutter element whereby the crests of said teeth extend between opposed corners of said element and intersect at their medial portions.

the crest of one of said teeth being directed radially of the axis of rotation of each rotary cutter,

the crest of the other tooth being directed circumferentially of the exterior of said rotary cutter whereby said tooth and its crest have leading and trailing ends at opposed corners of said quadrilateral cutter elements,

a coextensive cutting edge at the leading end of each circumferential tooth coinciding with the longitudinal edge of the leading corner of said quadrilateral cutter element and extending from the crest to the root of said tooth,

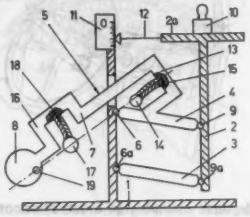
the leading corner of said circumferential tooth having a pair of surfaces receding from and coextensive with the longitudinal cutting edge thereof,

the pair of surfaces extending outwardly and rearwardly to points medially of said cutter element at its base.

3,946,821
BALANCE

Kaspar Saner, Dubendorf, Switzerland, assignor to Wirth Gallo & Company, Zurich, Switzerland

Filed Jan. 27, 1975, Ser. No. 544,570
Claims priority, application Switzerland, Aug. 14, 1974, 11140/74
Int. Cl.² G01G 3/18
U.S. Cl. 177—227 8 Claims

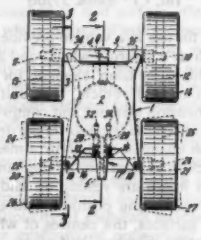


1. A balance, comprising:
a balance pan for receiving an object to the weighed;
object force transmitting means coupled to said balance pan for transmitting forces produced by the weight of an object on said pan;
a reference mass;
reference force transmitting means coupling said reference mass to said balance pan for transmitting forces produced by said reference mass to said pan to compensate for the mass of said pan, thereby to provide a reference zero-point force when no object is located on said pan;
a first compensating mass;
a first bimetallic support coupling said first compensating mass to said reference force transmitting means to compensate for a thermally induced shift of said zero-point;
a second compensating mass; and
a second bimetallic support coupling said second compensating mass to said object force transmitting means to compensate for a thermally induced change in the slope of the characteristic of said balance.

3,946,822
TRACKLAYING VEHICLE COMPRISING FOUR TRACKLAYING UNITS

Jurgen Dohse, and Klaus Klucker, both of Lubeck, Germany, assignors to O & K Orenstein & Koppel Aktiengesellschaft, Germany

Filed Dec. 20, 1974, Ser. No. 534,889
Claims priority, application Germany, Dec. 21, 1973, 2363755
Int. Cl.² B62D 11/20
U.S. Cl. 180—9.46 4 Claims

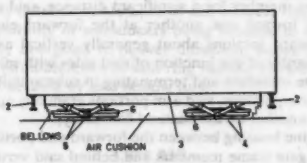


1. A tracklaying vehicle comprising first and second laterally spaced tracklaying units, third and fourth laterally spaced tracklaying units spaced longitudinally from said first and second tracklaying units, a substructure supported on said tracklaying units and mounted between said first and second and third and fourth units, a longitudinally extending carrier shaft on said substructure, a crossbeam having a bore receiving said carrier shaft, said crossbeam being rotatably mounted on said carrier shaft between said first and second tracklaying units and interconnecting said first and second tracklaying units,
said first and second tracklaying units being pivotally supported adjacent respective ends of said crossbeam for pivotal movement about a horizontal axis, said crossbeam being pivotable with said first and second tracklaying units about said longitudinally extending carrier shaft, and support means for pivotaly supporting said third and fourth tracklaying units on said substructure so that the units may be pivoted only about a substantially verfical axis for steering the vehicle.

3,946,823
DRIVING AND STEERING DEVICE FOR A LOADING PLATFORM

Ernst Bertil Oler, Karlskoga, Sweden, assignor to AB Bofors, Bofors, Sweden

Filed Dec. 10, 1974, Ser. No. 531,421
Claims priority, application Sweden, Dec. 21, 1973, 7317343
Int. Cl.² B60P 1/00; B62D 59/04; B60V 3/00
U.S. Cl. 180—23 7 Claims



1. In combination, a loading platform, a driving and steering device for said loading platform comprising a plurality of laterally spaced steering boxes arranged under the loading platform, each of said steering boxes including a plurality of wheel members disposed within a ball race, said wheel members being rotatable about horizontal axes and said ball race being rotatable with said wheels as a unit about a vertical axis, whereby said wheel members can be given a rotating movement for driving said loading platform and a turning movement for steering said loading platform, each of said steering boxes including motor means located within said ball race connected to said wheel members and movable with said unit about said vertical axis for selectively rotating said wheel members to drive said loading platform, gear teeth on said ball race, a driving gear in mesh engagement with said gear teeth, and an electrohydraulic steering system operative to rotate said driving gear thereby to rotate said unit through an angle about said vertical axis to steer said loading platform as it is driven by said wheel members.

3,946,824
CHASSIS FOR A VEHICLE WITH LARGE DIAMETER SINGLE FRONT WHEEL

Oden Jester, and Melvin A. Bergkamp, both of Salina, Kans., assignors to Rickel Manufacturing Corporation, Kansas City, Mo.

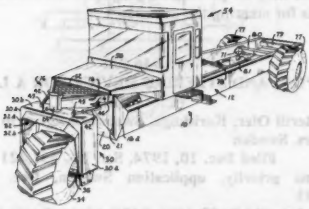
Filed May 28, 1974, Ser. No. 473,770
Int. Cl.² B62D 61/08
U.S. Cl. 180—27 6 Claims

1. A chassis for a vehicle having a single front tire, said chassis comprising:

a pair of spaced apart elongate linear frame members extending along a major portion of the length of said chassis and diverging from one another in a gradual manner from the rear of the chassis toward the front, said frame members being sloped gradually upwardly relative to horizontal from the rear of the chassis toward the front;

a rear axle secured to said elongate frame members toward the rearward portion thereof, said rear axle rotatably carrying a pair of rear wheels outwardly of the respective frame members;

a front chassis portion having opposite beam-like sides greater in cross sectional area than said elongate frame members, said sides being secured to the forward portions of said elongate frame members in forward and upward



extension therefrom with the rearward section of each side being substantially coplanar with the corresponding frame member for a significant distance, said sides being bent toward one another at the forward ends of said rearward sections about generally vertical axes spaced forwardly of the junction of said sides with said elongate frame members and terminating in substantially horizontal arm portions, said arm portions gradually approaching one another as they extend forwardly;

an engine housing between the forward end portions of said elongate frame members and behind said vertical axes;

a wheel yoke positioned beneath said arm portions and carrying said front tire; and

means for pivotally connecting said wheel yoke with said arm portions near the forward ends thereof.

3,946,825

AUTOMATIC STEERING SYSTEM FOR STANDING-CROP HARVESTER

Josef Gail, Unterwittelsbach near Aichach, Germany, assignor to Maschinenfabrik Fahr AG, Gottmadingen, Germany

Filed Aug. 12, 1974, Ser. No. 496,743

Claims priority, application Germany, Aug. 14, 1973, 2340983

Int. Cl.² B62D *5/06*

U.S. Cl. 180—79.2 R **9 Claims**

1. An automatic steering system for a standing-crop harvester having a chassis adapted to travel in a transport direction along the ground and carrying guide wheels operated by a steering element on the chassis, said system comprising:

sensor means at a forward location of said chassis in said transport direction and mounted on said chassis for detecting the edge of a swath cut in a standing crop and generating an output corresponding to the position of said edge relative to said chassis;

actuation means independent of said steering element and connected to said sensor means for receiving said output and controlling said guide wheels in accordance with said output; and

means for altering said output before reception thereof by said actuation means in accordance with the inclination of the ground under said chassis for biasing said chassis directionally in an uphill direction.

3,946,826

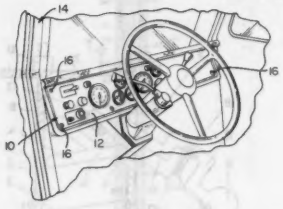
VEHICLE DASH ASSEMBLY

Richard E. Guhl, and Alfred W. Sieving, both of Decatur, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 29, 1975, Ser. No. 545,257

Int. Cl.² B60K *26/00*

U.S. Cl. 180—90 **1 Claim**



1. A vehicle dash assembly in a cab area comprising:

an instrument panel extending transversely across substantially the entire width of the cab area and upon which the vehicle instruments and associated control members are mounted, said panel having an upper side visible from the cab area and an underside;

a hinge along the top of said panel, said hinge pivotally connecting said panel with the vehicle cab structure such that said panel is movable from a closed condition to a fully pivoted open condition;

pivot means mounted to the underside of said panel;

an elongated support member having one end pivotally rotatably mounted on said pivot means, said member being formed with an elongated slot;

guide means mounted on the cab structure, said guide means cooperatively engaging said member slot wherein said member is guided by said guide means as said panel is moved from the closed condition to the open condition;

a plurality of shoulders formed in said member elongated slot, said shoulders cooperating with said guide means to hold said panel in a corresponding open condition; and

a bias spring mounted about said pivot means and acting against said elongated member, said spring force urging said member in a direction wherein said guide means will engage one of said plurality of shoulders such that said panel is held in the open condition.

3,946,827

CONTROL UNIT FOR A VEHICLE AND DASHBOARD INCORPORATING SAME

Jean Georges Cadiou, Saint-Cloud, France, assignor to Societe Anonyme Automobiles Citroen, Paris, France

Continuation of Ser. No. 312,305, Dec. 5, 1972, abandoned. This application Dec. 11, 1974, Ser. No. 531,770

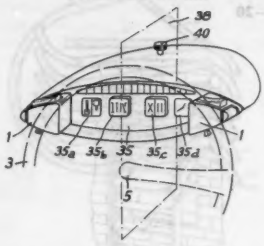
Claims priority, application France, Dec. 6, 1972, 72.43650

Int. Cl.² B60K *37/06*

U.S. Cl. 180—90 **15 Claims**

1. Control unit for use in a vehicle provided with a prehension element such as a steering wheel, and a rotary member connected to said prehension element for controlling the steering members of said vehicle, said unit being mounted adjacent said prehension element and comprising two control members disposed on the side opposite the driver with respect to said prehension element, said control members being disposed within reach of at least one of the hands of said driver when the driver's hands are resting on said prehension element in the normal driving position, said control members having actuating surfaces, the centres of which define, with the axis of the rotary member, half-planes shifted by a first angle, wherein the directions perpendicular to the actuating surfaces and passing through said centres, are contained in planes parallel to said axis, which planes form a second angle

larger than the first angle, and the intersection of said planes containing said directions is disposed, with respect to the plane parallel to the axis of the rotary member and containing the centres of the two actuating surfaces, substantially on the side where said axis is itself disposed, said control unit further

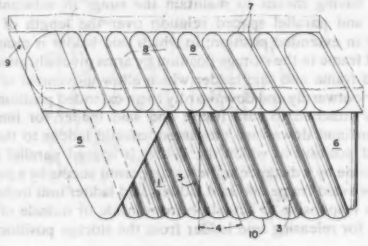


comprising a third control member which is in a relative disposition with respect to a first of said two control members, substantially identical to the relative disposition of the first and second of said two control members with respect to each other.

3,946,828
SLANTBACK, COMPLIANT SURFACE EFFECT VEHICLE SKIRT

Eugene N. Brooks, Jr., Sterling, Va., and Allen G. Ford, Rockville, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 17, 1974, Ser. No. 479,740
Int. Cl.² B60V *1/16*
U.S. Cl. 180—128 **1 Claim**

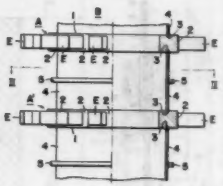


1. A surface effects vehicle skirt, comprising:
a multiplicity of air-inflatable tube-like elements each having a top end and a bottom free end wherein said elements are attached to said surface effects vehicle at the top end and wherein each of said elements is free to move independently of the other elements and free to deflate independently of the other elements and engage by friction only the next foreward adjacent element and the next rearward adjacent element and wherein each element is at a slant angle with the vertical rearward from top to bottom of the element and each element lies above a forward adjacent element and frictionally engages said forward adjacent element and inturn supports the next rearward adjacent element by frictional engagement so that the multiplicity of elements at least partially define one or more cushions of pressurized gas beneath the vehicle; and
a semi-conical front element and a closed rear bag to support the first and last elements, respectively.

3,946,829
ULTRASONIC DEVICE

Eiji Mori, Tokyo; Kozo Okada, and Saburo Ueno, both of Nagoya, all of Japan, assignors to Nippon Tokushu Togyo Kabushiki Kaisha, Nagoya, Japan

Filed Oct. 17, 1973, Ser. No. 407,289
Int. Cl.² G01K *10/00*, *11/06*
U.S. Cl. 181—142 **4 Claims**

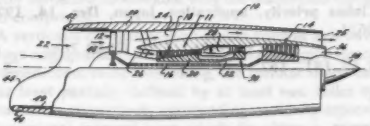


1. An ultrasonic device comprising:
a plural segment, elongate, hollow tube of generally circular cross section;
a metallic ring separating adjacent segments of said tube, each of said segments being secured to one of said metallic rings at a nodal point of radial vibration; and,
a plurality of electromechanical transducers fixed to the radially outer circumference of said metallic ring, each of said plurality of transducers being adapted to be vibrationally energized to deliver ultrasonic waves from the inner circumference of said ring radially inward into the cavity defined by said hollow tube.

3,946,830
INLET NOISE DEFLECTOR

John T. Kutney, Cincinnati, and Rodger B. Mishler, West Chester, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Sept. 6, 1974, Ser. No. 503,751
Int. Cl.² E04B *1/99*
U.S. Cl. 181—33 HA **11 Claims**



1. An inlet duct for selectively reducing noise propagation emanating within said duct and improving inlet pressure recovery, said inlet duct including a circumscribing lip and an upstream deflector means positioned within a first circumferential sector of said inlet duct, said deflector comprising an extension of said lip and projecting axially forward of a second circumferential sector of said duct, the improvement comprising:
a substantially arcuate axial contour of said lip at said deflector means wherein said contour has at least one point of curvature inflection.

3,946,831
ACOUSTIC TRANSMITTER

John V. Bouyoucos, Rochester, N.Y., assignor to Hydroacoustics Inc., Rochester, N.Y.

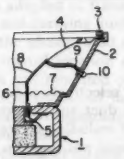
Division of Ser. No. 276,457, July 31, 1972. This application May 6, 1974, Ser. No. 466,938
Int. Cl.² H04B 13/02; G01V 1/02
U.S. Cl. 181—120 13 Claims

1. An acoustic transmitter which comprises
a. an acoustic transmission line having a plurality of ports disposed at spaced intervals along said line,
b. means included in each section of said line on opposite sides of each of said ports and around each of said ports for preventing reflection of acoustic energy within said line at each of said ports, and
c. a source of acoustic energy coupled to one end of said line for driving said line.

3,946,832
DIAPHRAGM FOR LOUD SPEAKER

Kazuro Takano, Hirakata; Masakuni Hirata, Katano, and Yasuo Kodera, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Dec. 4, 1974, Ser. No. 529,505
Claims priority, application Japan, Dec. 14, 1973, 48-140621
Int. Cl.² G10K 13/00; H04R 7/00
U.S. Cl. 181—167 5 Claims

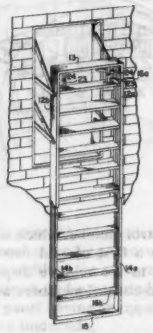


1. A diaphragm for a loud speaker made of cellulose impregnated with a solution of a water-soluble inorganic flame retarder and with a solution of a water repellent and oil repellent agent containing fluorine.

3,946,833
COLLAPSIBLE LADDER SUITABLE FOR USE AS FIRE ESCAPE

Joseph F. Riehlmann, 5862 Fleur de Lis Drive, New Orleans, La. 70100

Filed Dec. 13, 1973, Ser. No. 427,012
Int. Cl.² E06C 9/12
U.S. Cl. 182—20 1 Claim



1. A ladder unit for installation in a building comprising a ladder, a frame suitable for mounting in a window, and means for attaching said ladder to said frame; said ladder comprising a plurality of telescoping pairs of stile means including an upper pair of stile means having a rung attached adjacent to its upper end; a lower pair of stile means having a rung attached adjacent to its lower end; a plurality of slidable rungs slidably mounted in said stile means permitting positioning of said slidable rungs substantially adjacent to the attached rung on the upper stile means in the storage position; said slidable rungs having means to maintain the rungs in substantially equal and parallel spaced relation over the length of said ladder in extended position; in which said ladder is mounted in said frame in the storage position by arms pivotally attached to said frame and said ladder which allow movement of said ladder outwardly and downwardly to an extended position and means attached to said frame and said ladder for limiting outward and downward movement of said ladder to the extended position in which the ladder is spaced parallel from said frame by a distance sufficient to permit access by a person between said frame and said ladder; said ladder unit including means responsive to actuation from inside or outside of said frame for releasing said ladder from the storage position.

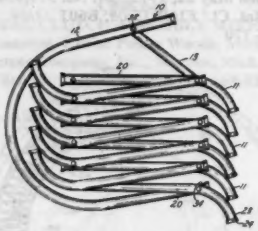
3,946,834
SELF STORING FIRE ESCAPE LADDER

Simon Shafer, 196-12 Keno Ave., Holliswood, N.Y. 11423, and Joseph Gilbert, 210 Pond X, Lawrence, N.Y. 11559

Filed Feb. 27, 1975, Ser. No. 549,618
Int. Cl.² E06C 5/26, 1/52
U.S. Cl. 182—164 2 Claims

1. An improved self-storing fire escape ladder comprising: a plurality of rung sections, each including a pair of parallel side rails, and at least one interconnecting rung extending laterally between said side rails, means pivotally interconnecting a plurality of said rung sections whereby the same may be selectively extended for use and folded upon each other to form a compact unit; and a generally U-shaped hook means pivotally connected at one end thereof to an uppermost of said rung sections, said hook means being of an effective width less than that of any of said sections, whereby the same, upon pivoting relative to said compact unit may substantially enclose said compact unit by fitting between the side rails thereof and prevent accidental separation thereof; and latch-

ing means for selectively interconnecting portions of said hook means and the lowermost of said rung sections to main-

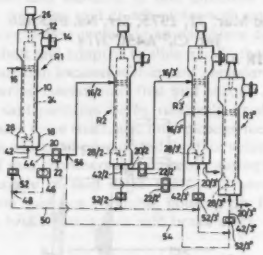


tain said hook means in enclosed condition relative to said compact unit.

3,946,835
METHOD AND APPARATUS FOR LUBRICATING THE INTERNAL BEARINGS OF THIN-LAYER EVAPORATORS, USED IN POLYMERIZATION OR POLYCONDENSATION INSTALLATIONS

Francesco Siclari, Barlassina (Milan), and Franco Magnoni, Milan, both of Italy, assignors to Snia Viscosa Societa' Nationale Industria Applicazioni Viscosa S.p.A., Milan, Italy

Filed Feb. 25, 1974, Ser. No. 445,098
Claims priority, application Italy, Feb. 26, 1973, 20871/73
Int. Cl.[2] F16N 7/14, 13/00
U.S. Cl. 184—7 D 7 Claims



1. The method of lubricating the internal rotor bearings of a series of thin-layer evaporators of the type that are connected in cascade to form part of a continuous polymerization or condensation installation in which the viscosity of the polymeric compound being treated increases until it reaches a viscosity range in which the physical state of the compound makes it suitable for use as a lubricant for said bearings, comprising the steps of

testing samples of the compound in at least one of the evaporators of said series of evaporators to determine which evaporator has the compound of proper viscosity for use as a lubricant for the bearings of said series of evaporators,

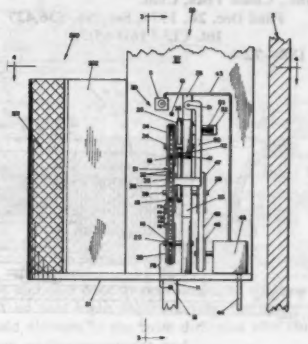
drawing off part of said polymeric compound from the selected evaporator, and

transporting the drawn compound to said bearings of said evaporators while maintaining the drawn compound at a temperature sufficient to keep it suitable for use as a lubricant for said bearings.

3,946,836
ELEVATOR SYSTEM HAVING CO-MOVING AND SHORT-LENGTH ANNULAR-BELT FOR SUSPENDING AND PROPELLING THE CARRIAGE

Norris N. Maack, R.R. No. 3, Box 66, West Point, Nebr. 68788

Filed Nov. 25, 1974, Ser. No. 526,576
Int. Cl.[2] B66B 5/16, 9/02
U.S. Cl. 187—8 8 Claims



1. In combination with a towering farm silo and analogous vertically lofty stationary structural environment, an elevator system for traversing a finite-length distance along said structural environment and comprising:

A. A lofty framework attached to and transversely offset of the structural environment and having along a vertically linearly extending finite-length distance thereof a lateral width defined by a pair of substantially parallel upright rails, at least one of said upright framework rails being a lugged-rail having along a finite-length distance a finite-number plurality of identical horizontally laterally projecting lugs spaced at liberal-increments which represents an integral multiple of a regular-spacing dimensional value;

B. A platformed carriage vertically movably associated along the framework through a connected yoke means that restrains the carriage in the transverse and lateral horizontal directions with respect to said upright rails as a carriage guide means;

C. A crawling-propulsion suspension assembly for both suspending and vertically propelling the carriage with respect to the lofty framework, the entire weight of the crawling propulsion assembly being carried by and directly vertically co-movable with the platformed carriage and comprising:

i. A vertically elongated short-length annular belt having lugs-engageable openings spaced at a regular-spacing dimensional value therealong, the annular shape being at least partially defined by at least two roller type members respectively surrounding vertically separated horizontal internal axes which lie along a common vertical plane including an upper axis and a lower axis, the annular belt having a lineal frontal-length extending in vertical elevation between said co-planar axes and lying parallel alongside the lugged-rail and having a vertical length sufficiently to simultaneously removably engage at least two laterally projecting lugs;

ii. driving means for the short-length annular belt and including a driver-sprocket type roller member having teeth engaged with the short-length annular belt;

iii. anti-slack tightening means for the annular belt, and

iv. dual-directional powering means for powerably rotating said driver-sprocket and controllable in both angular directions thereby propelling the carriage through the carried annular belt selectively upwardly and downwardly along the lugged-rail; and

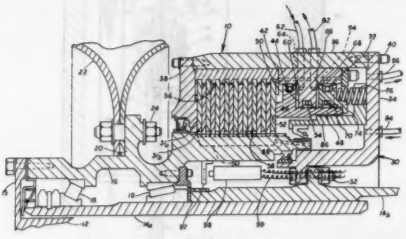
D. Safety-catch means biased against the annular belt to catch against a lugged-rail lug in the contingency of annular belt mis-function.

3,946,837

DISC BRAKE AND ACTUATOR ASSEMBLY

Raymond E. Houser, Wooster, Ohio, assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed Dec. 26, 1974, Ser. No. 536,427
Int. Cl.² F16D 65/32
U.S. Cl. 188—72.4 **2 Claims**



1. In a wheel braking apparatus including a drive axle, an axle housing, a wheel journalled on said housing, and a brake housing characterized by

an annular piston slidably positioned in said brake housing and forming a first pressure cylinder with said housing,

said wheel having a tubular hub extending into said brake housing and being concentric to a tubular portion thereof,

a stack of brake discs alternately keyed to said brake housing and to said hub by spline means,

a second piston operatively carried by said annular piston for limited axial movement therewith and in relation thereto, said pistons having axially aligned portions and pressure chambers, said annular piston being positioned for operatively engaging an end of said stack of brake discs to apply compressive pressure thereto,

said brake housing having an inwardly extending flange thereon positioned between axially aligned portions of said pistons and forming a wall of both of said pressure chambers, and said annular piston having an axially extending tubular section thereon extending away from said brake discs and being in sealed sliding engagement with said flange,

said second piston being slidably mounted on said tubular section, said second piston having a radially inwardly extending shoulder for engaging the end of said tubular section of said annular piston to force it towards said brake discs when said second piston is moved in that direction, said annular piston being independently movable towards said brake discs,

spring means positioned between said housing and said second piston to urge said second piston axially to move it and said annular piston into operative engagement with said brake discs,

fluid pressure supply means connecting to said first pressure cylinder to advance said annular piston and compress said stack of discs,

said housing, housing flange and said tubular section forming said second pressure cylinder,

said second piston being positioned in said second pressure cylinder, and

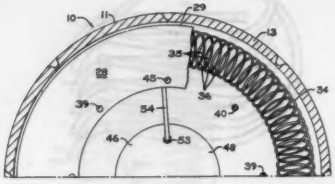
fluid pressure means connecting to said second pressure cylinder to move said second piston away from said brake discs against the force of said spring means whereby braking pressure can be provided solely from said first pressure cylinder.

3,946,838

FAIL-SAFE DISC BRAKE

William L. Daniels, Sr., Vandalia, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed May 22, 1975, Ser. No. 579,938
Int. Cl.² F16D 55/08; B60T 13/04
U.S. Cl. 188—170 **8 Claims**



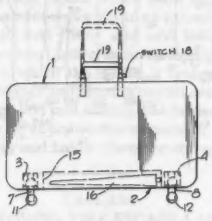
1. A fail-safe disc brake comprising a supporting body, a disc mounted for rotation relative to said supporting body, a friction member disposed between said supporting body and said disc, fluid pressure means connecting said supporting body and said friction member for moving said friction member in a direction away from said disc, spring means interposed between said supporting body and said friction member for moving said friction member of said disc, said spring means including a slant coil spring having coils extending around a spring axis in a plane generally parallel to said surface of said disc whereby opposite edges of each of said coils are urged apart for moving said friction member towards said disc.

3,946,839

SUITCASE DEVICE

Robert C. Butler, Rancho Palos Verde, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Mar. 31, 1975, Ser. No. 563,626
Int. Cl.² A45C 5/14
U.S. Cl. 190—18 A **3 Claims**



1. A suitcase device for a suitcase having a top and a bottom, said suitcase device comprising

a plurality of recesses formed in the bottom of a suitcase in spaced relation with each other;

a plurality of mounting means each movably mounted in a corresponding one of the recesses;

a plurality of wheels each rotatably mounted on a corresponding one of the mounting means; and

control means in the suitcase for selectively controlling the movement of the mounting means in the recesses in a manner whereby the wheels are spaced from the bottom of the suitcase for supporting said suitcase in one position and are retracted into the recesses in another position, said control means comprises a source of electrical energy, a switch mounted at the handle, a plurality of electromagnets each in operative proximity with a corresponding one of the mounting means and circuit means

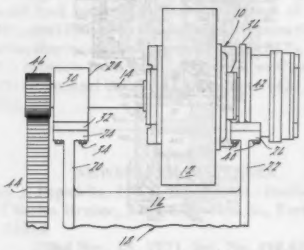
electrically connecting the source of electrical energy, plurality of electromagnets and switch in circuit.

3,946,840

FLYWHEEL CLUTCH ASSEMBLY WITH BRAKE

Gordon M. Sommer, Grosse Pointe Woods, Mich., assignor to G. M. Sommer Company, Inc., Warren, Mich.

Filed May 10, 1974, Ser. No. 468,827
Int. Cl.[2] F16D *67/04*
U.S. Cl. 192—18 A **1 Claim**



1. In combination with a rotatable housing formed of a flywheel and spaced rotatable end plates mounted on a pair of spaced bearings on a drive shaft supported in bearings in which it is to be driven by said flywheel, a clutch unit disposed internally of the flywheel between said spaced bearings and comprising a plurality of clutch plates connected to the flywheel and a plurality of clutch discs connected to said drive shaft, a non-rotatable housing axially spaced from said rotatable flywheel, a brake within said non-rotatable housing comprising a plurality of brake plates connected to said non-rotatable housing and a plurality of brake discs connected to said drive shaft, first actuating means disposed within said rotatable flywheel and movable in one direction for selectively frictionally engaging said clutch plates with said clutch discs, said actuating means including an enclosure concentric with said drive shaft and adapted to slide axially thereof, a radially disposed partition located within said enclosure and separating the interior thereof into first and second axially spaced chambers, said partition being relatively axially immovable relative to said drive shaft, and fluid passage means communicable with a source of pressurized fluid for selectively pressurizing one of said chambers and thereby causing said enclosure to move axially of said drive shaft, and second actuating means within said non-rotatable housing for frictionally engaging said brake plates with said brake discs.

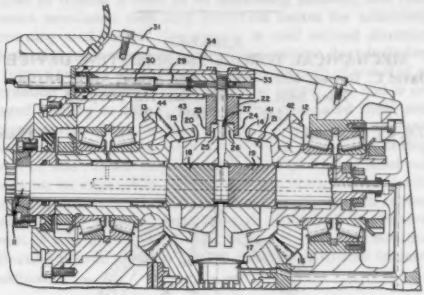
3,946,841

SHIFT MECHANISM FOR A MARINE CLUTCH

Robert L. LaFollette, Baldwinsville, and Kenneth H. Miller, Syracuse, both of N.Y., assignors to American Challenger Corporation, Fulton, N.Y.

Filed July 17, 1974, Ser. No. 489,365
Int. Cl. F16d *21/04*; **F16h** *3/08*; **F16d** *23/00*
U.S. Cl. 192—35 **6 Claims**

1. In a clutch mechanism of the type comprising:
an input shaft having first and second oppositely threaded drive spiral threads thereon, an output shaft, forward and reverse driving gears rotatably mounted on said input shaft, each of said gears having a clutch surface, an output gear affixed to said output shaft and engaged with said driving gears, and first and second clutch elements each having threads which respectively match said first and second driving spiral threads, each having a clutch surface respectively mating with the clutch surface of said forward and reverse driving gears and each having a flange, an improved shifting mechanism;
a yoke having two legs extending over the flanges on said clutch elements;
a member movable axially by a shift linkage, said member engaging said first and said second clutch elements so that said axial movement of said member causes axial movement of said clutch elements;
means for providing axial drag on said yoke so that axial movement of said member pinches a flange between said



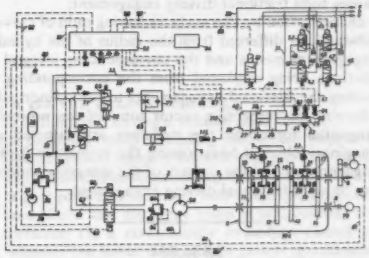
member and said yoke to slow down the rotation of said element on said input shaft whereby the spiral threads drive said element in the axial direction into clutch engagement or disengagement; and
friction material on said member to increase the slowing of rotation of said clutch elements when engaged by said member.

3,946,842

ELECTRIC AND FLUID CONTROLS FOR CLUTCH AND TRANSMISSION

Gunter Siebers, Dahlmannstr. 32, 85 Nurnberg; Karl Prenzel, Chemnitzerstr. 27a, 8541 Neu-Katzwang, and Hans Barthel, Bothmerstr. 16, 85 Nurnberg, all of Germany

Division of Ser. No. 46,555, June 15, 1970, Pat. No. 3,808,738.
This application Oct. 17, 1973, Ser. No. 407,280
Claims priority, application Germany, June 13, 1969, 1930046
Int. Cl.[2] F16H *5/36*; **B60K** *21/00*
U.S. Cl. 192—3.58 **1 Claim**



1. In an apparatus comprising a gear-box having driven members, driving members and members to be moved to selectively engage a driven member with a driving member, and hydraulic means for moving said members to be moved, means for driving said driven members comprising an input shaft, an engine, a friction clutch for coupling the shaft to the engine and means for actuating the clutch comprising a cylinder having a piston slidably disposed therein and connected to a movable part of the clutch, a source of fluid under pressure, a fluid return reservoir, a hydraulically operated main valve for actuating the piston, said main valve being connected to the cylinder, the fluid source and the fluid return reservoir, an electromagnetically operated primary valve of smaller volume than that of the main valve for actuating the main valve, said primary valve being in fluid connection with the main valve,

the fluid source and the fluid return reservoir, means comprising an electrical control unit for actuating the primary valve, and

a fluid flow restriction means having a one-way valve parallel thereto effective only to allow fluid flow towards the piston-cylinder assembly from said valve arrangement.

3,946,843

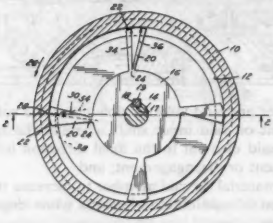
MECHANICAL TORQUE TRANSMITTING DEVICE

David C. Downs, 402 Virginia, Ann Arbor, Mich. 48104

Filed Sept. 26, 1974, Ser. No. 509,559

Int. Cl.² F16D *41/06*

U.S. Cl. 192—45.1 **23 Claims**



1. Torque transmitting means comprising, a first element having cylindrical engagement means, a second element coaxial with the first element and rotatable relative thereto;

a plurality of members integrally connected to the second element and extending therefrom, surfaces on the members adapted to frictionally engage the cylindrical engagement means, the integral connections adapted to flexibly urge the members into contact with the first element, whereby relative rotation between the first element and the second element in one direction causes slippage of the frictional engagement and opposite relative rotation causes tight frictional driving engagement;

and characterized by, the surfaces having radii of curvature substantially different from the radius of the cylindrical engagement means and the corresponding integral connections being displaced from the corresponding radii joining the frictional engagements to the cylindrical axis whereby the respective vector sums of the normal and tangential forces on the members are directed along imaginary chordal lines joining the respective frictional engagements and the centers of the integral connections during tight frictional driving engagement.

3,946,844

CLUTCHING MEANS ADAPTED FOR TAPPING ATTACHMENTS

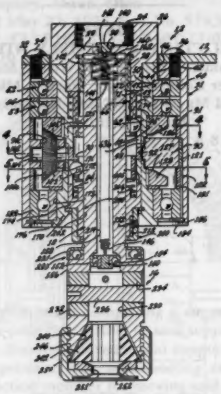
Allan S. Johnson, Newport Beach, Calif., assignor to Tapmatic Corporation, Irvine, Calif.

Continuation-in-part of Ser. No. 508,344, Sept. 23, 1974, abandoned. This application Nov. 4, 1974, Ser. No. 520,409

Int. Cl.² F16D *11/00*

U.S. Cl. 192—67 R **13 Claims**

1. In coupling means for transmitting torque, in combination, a first rotating member, a second axially aligned rotating member, said members being relatively movable axially, means for transmitting rotary drive from one member to the other, said means including at least one ball member positioned between the members, both members having axial configurations engageable with the ball member whereby drive is transmitted through the ball member, a circular carrier for said ball member, resilient means biasing the circular carrier, said ball member having rolling engagement to move



said carrier against said resilient means upon relative movement of said rotating members.

3,946,845

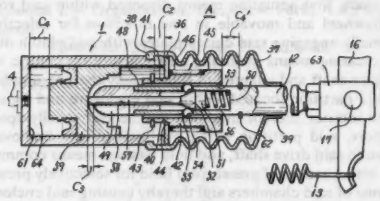
CLUTCH RELEASE CLEARANCE ADJUSTER

Takenori Kamio, Neyagawa, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Dec. 31, 1974, Ser. No. 537,708

Int. Cl.² F16D *13/75*

U.S. Cl. 192—111 A **3 Claims**



1. In a clutch system including a clutch master cylinder (3), a clutch release clearance adjusting mechanism which comprises

a slave cylinder (1) having an open end, and being connected to said clutch master cylinder (3);

a piston (59) slidably inserted in slave cylinder (1);

a release yoke lever (16);

a push rod (12) connecting said piston (59) with said release yoke lever (16);

a sleeve (42) coaxial with push rod (12);

an annular holder plate (36) abutting the open end of slave cylinder (1) and being held inside a boot (37) attached between slave cylinder (1) and push rod (12) and being connected to push rod (12) by way of an adjuster assembly which permits push rod (12) to recede only as far as a predetermined clearance C_2, so as to give a predetermined release clearance C_1 soon after the clutch is fully released, said adjuster assembly consisting essentially of locking means in cooperation with said push rod (12) and said sleeve (42),

said holder plate (36) being provided with an inner hole (40) in which aforesaid sleeve (42) is slidably journalled as far as clearance C_2 corresponding to release clearance C_1, said sleeve (42) being loaded to project outwardly from cylinder (1) by a spring (46) which is weaker than

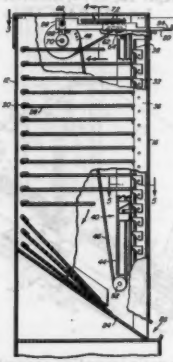
a return spring (13), push rod (12) being slidably inserted in sleeve (42), and a lock device being installed between sleeve (42) and push rod (12) which device is released only when thrust bearing (21) is pressed against release levers (24), and

said push rod (12) being provided with a pipe portion (48) where a head (49) with axial hole (58) is fixed, a lock piece (51) with a tapered portion (52) is inserted in the pipe portion (48), a subsidiary push rod (57) integral with lock piece (51) slidably fits inside hole (58), a compression spring (56) the effective force of which is weaker than the effective force of spring (34) but which is stronger than is return spring (13) being disposed between lock piece (51) and the bottom of pipe portion (48), steel balls (54) are disposed in respective holes (55) facing sleeve (42) and tapered portion (52), and push rod (57) projects from head (49) as far as C_3 against piston (59) when steel balls (54) lock sleeve (42) and push rod (12).

3,946,846
NEWSPAPER DISPENSER

Anthony J. Pepiciello, 180 E. Beach Blvd., Dania, Fla. 33004, and Charles Hrabec, 3241 SW. 44th St., Fort Lauderdale, Fla. 33312

Filed Nov. 15, 1971, Ser. No. 198,651
Int. Cl.² G07F 11/06
U.S. Cl. 194—1 A 10 Claims

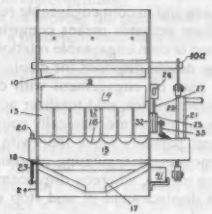


1. A vending device for newspapers or the like, said device comprising a housing, a plurality of spaced, pivotally mounted shelves in said housing, each movable between a storing position and a dispensing position, a plurality of release dogs each associated with one of said shelves and normally connected thereto for supporting it in said storing position, said release dogs being spaced along a predetermined path of travel and being pivotally mounted for movement from a normal shelf-supporting position toward a shelf-release position, master dog means adapted to be advanced in a first direction along said path of travel to move each release dog from its support position to its self-release position, said master dog means including a pivotally mounted master dog rotatable between an actuation position and a reset position, first stop means defined by a first stop surface associated with each of said release dogs to prevent pivotal rotation of said release dogs in one direction due to the weight of the supported shelves but permit pivotal rotation in the opposite direction by said master dog as it is advanced along said path of travel in said first direction, said master dog means including second stop means defined by a second stop surface to prevent pivotal movement of said master dog when actuating said release dogs by advancement of said master dog means in said first direction of travel and permit pivotal rotation of said master dog when said master dog means is moved backward in a direction opposite said first direction of travel, actuation means for normally selectively advancing said master dog means a predetermined incremental distance in said first direction along said path of travel to release a shelf to its dispensing position, and reset means associated with said actuation means for selectively returning said master dog means in said second direction along said path of travel, each of said release dogs including a release surface which lies directly in said path of travel of an actuation surface associated with said master dog and is engaged thereby to effect release of the associated shelf, said release surface being on the lower side of said release dog, said actuation surface being on the upper side of said master dog, each of said release dogs being provided with first reset surfaces on its upper side, said master dog being provided with second reset surfaces on its lower side, said first and second reset surfaces wipingly engaging each other upon reset movement of said master dog means in said second direction and effecting pivotal rotation of said master dog toward its reset position.

3,946,847
GOLF BALL VENDOR

Oscar Bock, Madison, Wis., assignor to Bock Corporation, Madison, Wis.

Filed Nov. 4, 1974, Ser. No. 520,775
Int. Cl.² G07F 11/00
U.S. Cl. 194—57 6 Claims



1. A golf ball vendor comprising:

a. a ball hopper having a bottom pan;

b. a declining ramp extending below said hopper bottom pan in spaced relation thereto, said pan and ramp defining a ball dispensing opening therebetween;

c. a gate pivotably mounted below said hopper bottom pan and above said discharge ramp at said opening rotatable between (1) a downwardly extending closed position wherein the lower edge of said gate is spaced more than the diameter of one ball and less than the diameter of two balls from said ramp to cause said balls in said hopper to bridge across said opening and (2) a release position into which said gate is swung toward the mass of balls in said hopper to break up the bridging of the balls therein for releasing balls down said ramp;

d. means providing a plurality of descending ballways each accommodating a single file roll of balls;

e. rotatably mounted ball receiver extending across the lower ends of said descending ballways for receiving a predetermined number of balls from said ballways; and

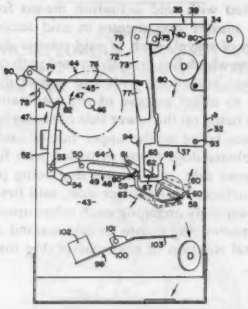
f. manually movable actuating means operatively linked to said ball receiver and said gate for rotating said ball receiver for dumping balls therefrom and for rotating said gate from said closed position to said release position.

3,946,848

COIN TOTALIZER MECHANISM

Karl Knickerbocker, 400 Baycrest Drive, Venice, Fla. 33595

Filed Sept. 5, 1974, Ser. No. 503,497
Int. Cl.² G07F 5/00
U.S. Cl. 194—94 **21 Claims**



1. A coin totalizer mechanism of the type to be used with a vending machine: said machine comprising, a casing to which at least a portion of said coin totalizer mechanism is attached, coin chute means connected to said casing and configured to at least partially define a coin flow path; totalizer means connected to said casing and including register means, register actuator means engaging said register means in driving relation thereto and disposed at least in part in coin interruptive relation to said coin flow path; totalizer actuator means movably disposed in interruptive relation to said register actuator means and in coin engageable relation to said flow path, said totalizer actuator means comprising gauge means movably mounted in coin engageable relation to said coin flow path, said gauge means disposed for displacement relative to said coin flow path by engagement with coins of predetermined coin characteristics, said totalizer actuator means further including stop means mechanically coupled to said guage means to at least partially move therewith, said stop means disposable in movement regulating position relative to said register actuator means, whereby displacement of said guage means controls displacement of said stop means to regulate movement of said register actuator means in response to coins of predetermined characteristics.

3,946,849

COIN-CHUTE FOR TESTING THE FERROUS CONTENT, WEIGHT, AND PRESENCE OF AN APERTURE IN COINS

Mitchell A. Hall, Fort Thomas, Ky., assignor to Monarch Tool & Manufacturing Company, Covington, Ky.

Filed June 9, 1975, Ser. No. 584,774
Int. Cl.² G07F 3/02
U.S. Cl. 194—97 B **23 Claims**

1. A coin-chute having an upper coin-token receptive end, an intermediate coin-token testing portion, and a lower discharge end for acceptable coin-tokens, comprising

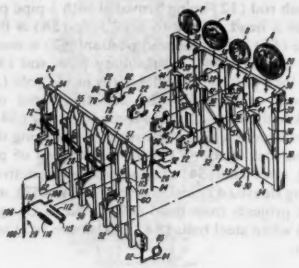
a. an inclined guide for slidably supporting a face of a coin-token, wherein said guide includes an elongate aperture having a lower edge, said aperture located in said intermediate testing portion and defining an area through which spurious coin-tokens are rejected;

b. first means in said intermediate portion for detecting and ejecting spurious coin-tokens having a ferrous content;

c. second means in said intermediate portion for detecting and ejecting spurious coin-tokens having an aperture therethrough; and

d. third means in said intermediate portion for detecting and ejecting spurious coin-tokens having less than a predetermined weight,

e. wherein said guide includes a pair of side walls laterally spaced to accommodate the diameter of an acceptable coin-token, one of said walls being discontinuous adjacent said elongate aperture, wherein coin-tokens deflected by any of said means are shifted transversely of said guide from the other of said side walls, for gravitationally urging the coin-token into said aperture.

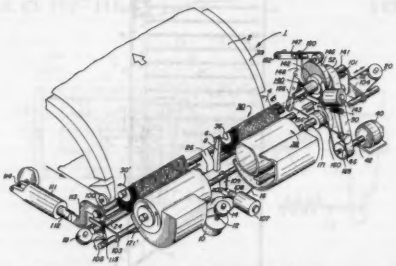


3,946,850

INDEXING MEANS FOR DONOR ROLL

Stuart E. Hotchkiss, Dallas, and Reginald H. Fowler, Richardson, both of Tex., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 12, 1974, Ser. No. 460,319
Int. Cl.² B41J 27/16
U.S. Cl. 197—1 R **1 Claim**



1. In an electrostatic recording apparatus having a developing member when actuated to bring marking material into developing relationship with latent electrostatic images formed on an imaging member and a movable donor member with marking on the periphery thereof and engageable with said developing member to replenish marking material removed from said developing member through developing of said latent images, the improvement comprising:

means for actuating said developing member to develop said images with marking material, said developing member actuating means including means for rotating said developing member to develop images on said imaging member; and, driving means for said donor member responsive to actuation of said developing member to move said donor member through a predetermined arc whereby to bring a fresh portion of said donor member periphery into replenishing position for engagement by said developing member, said donor driving means including an eccentric rotatable with said developing member, a follower riding on said eccentric, and link means drivingly coupling said follower with said donor member to move said donor member through said predetermined arc upon rotation of said developing member; said link

means including one way clutch means to prevent reverse movement of said donor member and a pair of link members, one of said link members having a slot-like aperture, a drive pin on the other of said link members disposed within said aperture whereby to drivingly couple said pair of link members together, said follower being supported on said one of said link members, said other of said link members being coupled to said clutch whereby said pair of link members form a driving connection from said follower to said clutch, and adjusting means for changing the position of said drive pin in said aperture.

3,946,851
ELECTROMAGNETIC ASSEMBLY FOR ACTUATING A STYLUS IN A WIRE PRINTER

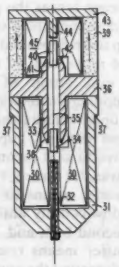
Jacques Cestrieres, Paris; Christian Condon, St. Ouen, and Bernard Mouton, Creteil, all of France, assignors to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 330,659, Feb. 8, 1973, abandoned. This application Oct. 11, 1974, Ser. No. 514,056

Claims priority, application France, Feb. 18, 1972, 72.05558

Int. Cl.² B41J 1/18

U.S. Cl. 197—1 R **10 Claims**



1. An electromagnetic assembly for moving a stylus in a wire printer between a retracted home position and an actuated print position comprising:

first magnetic circuit means having as an element thereof a first movable core adapted to be connected to said stylus to move with said stylus between said retracted home position and said actuated print position;

second magnetic circuit means having a second movable core adapted to be connected to said stylus to move with said stylus between said retracted home position and said actuated print position;

permanent magnetic retaining means forming part of said second magnetic circuit means for producing a first magnetic flux biasing said second movable core toward said retracted home position;

first energizable means for inducing in said first magnetic circuit means a second magnetic flux for forcing said first movable core into said actuated print position; and

second energizable means for inducing in said second magnetic circuit a third magnetic flux for nullifying said first magnetic flux produced by said permanent magnetic retaining means concurrent with the energization of sais first energizable means.

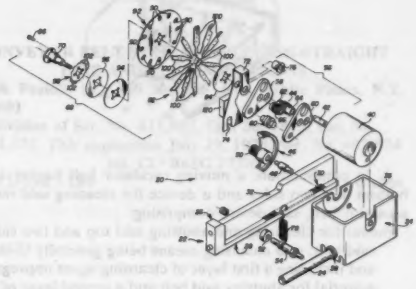
3,946,852
PRINTER

Alan J. Watson, Montville, and Heinz R. Guenther, Cedar Knolls, both of N.J., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 11, 1974, Ser. No. 449,883

Int. Cl.² B41J 1/32

U.S. Cl. 197—53 **4 Claims**



1. A printer comprising:

a type wheel having two radially spaced, concentric, circular rows of typefaces;

hammer means for selectively actuating the typefaces of the print wheel to effect printing;

carriage means for moving the print wheel and the hammer means along a predetermined path defining a plurality of printing positions;

said printing positions being arranged in first and second groups;

means rotatably supporting the printing wheel on the carriage means and supporting the printing wheel for pivotal movement on the carriage means between a first position wherein the first row of typefaces is aligned with the hammer means and a second position wherein the second row of typefaces is aligned with the hammer means;

a cam extending generally along the predetermined path and including a first portion extending parallel to the path and adjacent to the first group of printing positions, a second portion extending parallel to the path and at a different elevation than the first portion and adjacent to the second group of printing positions, and a camming surface interconnecting the first and second portions;

a drive motor mounted on the carriage means and having an output shaft;

a drive pinion mounted on the output shaft of the drive motor for rotation thereby; a print wheel drive gear meshing with the drive pinion;

a drive shaft interconnecting the print wheel drive gear and the print wheel;

a cam follower mounted on the print wheel drive shaft and engaging the cam so that the first row of typefaces on the print wheel is aligned with the hammer means when the cam follower engages the first portion of the cam and so that the second row of typefaces on the print wheel is aligned with the hammer means when the cam follower engages the second portion of the cam;

a reduction gear meshing with the drive pinion;

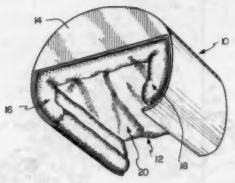
a pinion mounted on the reduction gear for engagement therewith; and

a rack extending along the predetermined path and meshing with the reduction gear pinion to move the carriage means along the predetermined path under the action of the drive motor.

3,946,853
ESCALATOR BELT CLEANER

Koji Ishida, 3 of 5, Ryoke 1, Urawa, Saitama, Japan

Filed May 15, 1974, Ser. No. 470,023
Claims priority, application Japan, Sept. 27, 1973, 48-112727[U]; Jan. 23, 1974, 49-10757[U]
Int. Cl.² B61B *13/14*
U.S. Cl. 198—16 R **9 Claims**



1. In combination, a moving escalator belt having a top, bottom and two sides and a device for cleaning said moving escalator belt, said device comprising:

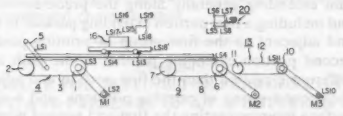
means for cleansing and abutting said top and two sides of said belt, said cleansing means being generally U-shaped and including a first layer of cleansing agent impregnated material for abutting said belt and a second layer of resilient material for biasing said first layer into abutment with said belt; and

means engaging said cleansing means and having a generally C-shaped resilient housing, which encompasses more than said top and two sides of said belt for securing said cleansing means to said belt and biasing said cleansing means into continuous abutment with said top and two sides of said belt.

3,946,854
TRANSPORTING METHOD

Hiromitsu Kojima, Takehara, and Kimio Yoshida, Osaka, both of Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo and Fuji Sangyo Co., Ltd., Osaka, both of, Japan

Filed Feb. 14, 1974, Ser. No. 442,598
Int. Cl.² B65G *47/52*
U.S. Cl. 198—21 **5 Claims**



1. In a method of transporting articles, particularly electrode plates, comprising the steps of:

providing a first conveyor having a first endless conveyor belt adapted to have said articles deposited thereon and transported thereby, said first belt having a substantially horizontally extending upper reach with a loading station and a discharge station associated therewith for respectively permitting articles to be deposited on and removed from the first belt;

sequentially depositing said articles one-by-one on said first conveyor belt at said loading station;

intermittently moving said first belt and the articles deposited thereon in timed relationship with the depositing of articles on said first belt so that the articles as deposited on said first belt are located in succession one after the other with a predetermined uniform distance between each pair of adjacent articles, the intermittent moving of said first belt causing said articles to be advanced toward said discharge station;

providing a second conveyor having a second endless conveyor belt associated therewith and adapted to have groups of said articles deposited thereon and transported therealong, each said group containing a preselected number of adjacent and aligned articles, said second belt having a substantially horizontally extending upper reach with supply and removal stations associated therewith for respectively permitting the articles to be deposited on and removed from said second belt;

providing transfer means disposed above and movable back and forth between said first and second conveyors for transferring articles from said first belt to said second belt;

moving said transfer means in a rearward direction from said second belt toward said first belt and then stopping said transfer means (1) upon sensing the frontmost article of a group as supported on said first conveyor belt, or (2) upon reaching a predetermined position relative to said first conveyor belt without having sensed the presence of a said group;

after stoppage of said transfer means, transferring said group from said first conveyor to said transfer means by lifting said group upwardly through a preselected distance so that said group is removed from said first belt and is supported on said transfer means;

moving said transfer means containing thereon said group of articles in a forward direction toward said second conveyor until said group is positioned over and spaced upwardly from the upper reach of said second belt;

maintaining said group on said transfer means while continuing the forward movement of said transfer means until said transfer means senses the presence of a preselected space on said second belt of a size capable of permitting said group to be deposited on said second belt;

continuing the forward movement of said transfer means, while maintaining said group of articles supported thereon, and then stopping the forward movement of said transfer means (1) upon sensing the rearmost group of articles on said second belt or (2) upon reaching a preselected position relative to said second conveyor;

after stoppage of said transfer means, then transferring said group from said transfer means to said second belt by moving said group downwardly until it is deposited and supported on said second belt; and

then moving said transfer means rearwardly toward said first conveyor upon detecting the completion of the transfer of said group to said second belt to permit the initiation of a further cycle of operation.

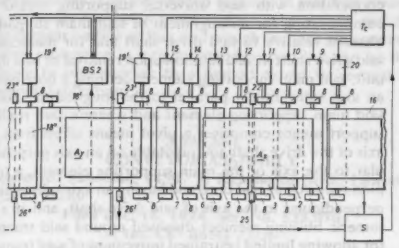
3,946,855
DEVICE FOR DELIVERING ITEMS AT CERTAIN INTERVALS

Willi Weil, Hamburg, Germany, assignor to Lever Brothers Company, New York, N.Y.

Filed June 18, 1974, Ser. No. 480,348
Claims priority, application Germany, June 18, 1973, 2330925
Int. Cl.² B65G *47/26*
U.S. Cl. 198—34 **2 Claims**

1. A device for delivering successive articles to a packaging machine comprising a series of rollers each of which is driven by its own two speed constant acceleration/deceleration motor and arranged so that an article is supported and conveyed jointly by a number of successive rollers as it passes through the device, control means for the control of each roller motor individually to effect a first stage of transport wherein the article is fed into the device at a high speed and taken to a synchronisation position and to effect a second stage of transport wherein the article is fed out of the device at a low speed said control means switching individual rollers from a high speed to a low speed in response to a synchronisation signal from the packaging machine, said conrol means incorporating a timing means which is arranged to control the speeds of the

rollers such that after an article is moved out from the synchronisation position at the low speed it can subsequently change the speeds of successive rollers over from the low speed to the high speed at predetermined time intervals after



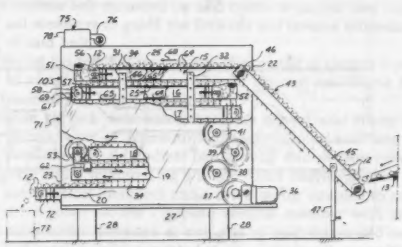
activation of the control means, to thereby enable a subsequent article to be moved into the synchronisation position at the high speed, while the preceding article is still being fed out of the device at the low speed.

3,946,856

APPARATUS FOR PROOFING LUMPS OF DOUGH

Frank J. Herrera, Downey, Calif., assignor to Casa Herrera, Inc., Los Angeles, Calif.

Filed Aug. 13, 1974, Ser. No. 497,016
Int. Cl.² B65G *37/00*
U.S. Cl. 198—84 **8 Claims**



1. Apparatus for proofing lumps of dough, comprising in combination:

a series of elongate conveyors for successively transporting said lumps of dough, each conveyor having its own distinct endless conveyor loop;

means for mounting said elongate conveyors into a spatially staggered relationship;

means coupled to said conveyors for driving the endless conveyor loops of said conveyors;

a plurality of auxiliary conveying systems each associated with a different pair of elongate conveyors for transferring lumps of dough from an end of one conveyor of the particular pair to a portion of the other conveyor of that particular pair spaced from an end of said other conveyor, said auxiliary conveying systems include a further endless conveyor loop being smaller than each of said conveyor loops of said series of elongate conveyors, means for mounting said further conveyor loop in the vicinity of an adjacent pair of elongate conveyors at a spacing from the adjacent pair of elongate conveyors sufficient for the transfer of lumps of dough between said further endless conveyor loop and the adjacent pair of elongate conveyors, and means for driving said further endless conveyor loop and said distinct endless conveyor loops in mutual synchronism, said mounting means including a curved support for guiding said further conveyor loop in a concave path adjacent the latter pair of elongate conveyors and a spaced pair of retaining strips for retaining and guiding edge portions of said further conveyor loop in said concave path;

means for feeding lumps of dough to a first elongate conveyor in said series;

means for deriving transported lumps of dough from a last elongate conveyor in said series;

enclosure means for said elongate conveyors and said auxiliary conveying systems; and

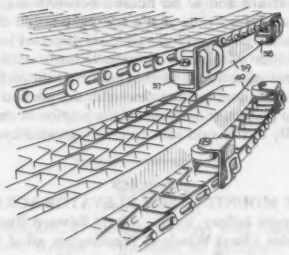
means for providing inside said enclosure means a proofing environment for said lumps of dough.

3,946,857

CONVEYOR BELT SYSTEM INCLUDING STRAIGHT LINE AND CURVED SECTIONS

Joseph Fraioli, Sr., 300 Martine Ave., White Plains, N.Y. 10601

Division of Ser. No. 411,082, Oct. 30, 1973, Pat. No. 3,854,575. This application July 29, 1974, Ser. No. 492,854
Int. Cl.² B65G *17/00*
U.S. Cl. 198—189 **3 Claims**



1. An endless chain belt conveyor system for transporting articles along a path which includes a straight line section, said straight line section comprising:

A. a trackway extending along said straight line section and constituted by a pair of parallel rails,

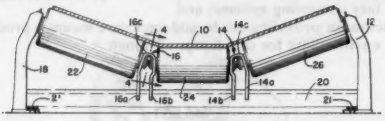
B. an endless belt movable along said trackway and having a width which is greater than the distance between the outer surfaces of said pair of rails, the opposing outer margins of said belt overhanging the respective rails of said trackway and riding thereover whereby said rails which lie below the belt function as a bed for said belt, and

C. rollers mounted on the underside of the overhangs of said belt at spaced positions along the outer margins thereof, the rollers on one of said margins engaging and rolling along the outer surface of one of said rails and being tracked thereby, the rollers on the other of said margins engaging and rolling along the outer surface of the other of said rails and being tracked thereby, whereby lateral displacement of the belt in the course of movement is prevented, the upper side of said overhangs being free of obstruction to provide an uninterrupted belt surface which may be lifted relative to said rails, the rollers at opposing margins of the belt being rotatably supported at either end of a double-ended bracket whose shank is attached to said belt.

3,946,858
SELF-CAPTIVATING KEEPER FOR IDLER ROLLS

Daniel Joseph Diantonio, Nutley, N.J., assignor to Litton Systems Inc., Passaic, N.J.

Continuation of Ser. No. 389,163, Aug. 17, 1973, abandoned.
This application Jan. 31, 1975, Ser. No. 545,805
Int. Cl.² B65G *39/12*
U.S. Cl. 198—192 R **9 Claims**



1. A support and keeper assembly for a roll shaft: comprising

a. support means carrying at least a seat and provided with at least an aperture through which at least a portion of a roll shaft may enter to be received by said seat;

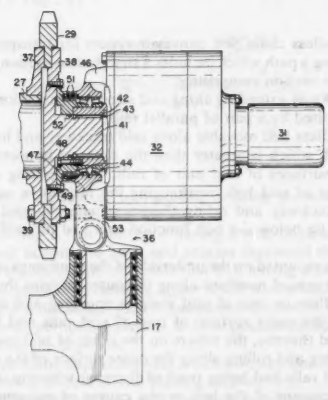
b. said support means further extending into substantially horizontally disposed abutment means proximate to and on each side of said aperture and raised with respect to said aperture and seat; and

c. keeper means of a configuration having a top surface and a bottom surface and being of an extent sufficient to span said aperture and to be housed between said abutment means and a portion of the roll shaft when disposed in said seat, so that said top surface is disposed beneath and for coaction with said substantially horizontally disposed abutment means and so that said bottom surface is disposed above and for coaction with the portion of the roll shaft, to prevent movement of the portion of the roll shaft upwardly out of said seat and through said aperture.

3,946,859
DRIVE MOUNTING FOR ELEVATOR SCRAPER

Charles Jerrold Jeffrey, Pekin; Albert Edward Rust, Morton, and Willaim Albert Winslow, Washington, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 2, 1974, Ser. No. 494,088
Int. Cl.² B65G *23/22*
U.S. Cl. 198—203 **7 Claims**



1. In a scraper elevator having a main supporting element and a conveying mechanism comprising a drive structure having a pair of laterally disposed drive sprockets carried on a drive shaft driven by a demountable elevator drive unit, in combination, means for mounting the drive structure on the main supporting element comprising

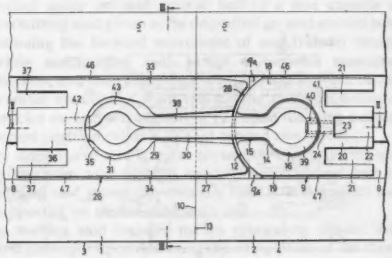
universal support means pivotable on three axes for connecting one end of the drive shaft to the main supporting element; and

resilient support means connecting the other end of the drive shaft to the main supporting element and acting in cooperation with said universal supporting means for compensating for misalignment of said main supporting element relative to said drive shaft and for maintaining said drive shaft in said relation upon removal of said drive unit, said main supporting element defining a bore having an axis substantially parallel to the longitudinal axis of said main supporting element and wherein said resilient support means comprises a pivot means offset from the axis of the drive shaft and pivotable on an axis perpendicular to the axis of the main supporting element, a trunnion received in said bore and having an axis substantially perpendicular to the axis of said drive shaft, and an elastomeric bushing member disposed around said trunnion for allowing limited restrained movement of said trunnion in said bore.

3,946,860
CONVEYOR CONSTRUCTION

Reinhold Krohm, Herne, and Karl Bähre, Gladbeck, both of Germany, assignors to Klockner-Werke Aktiengesellschaft, Duisburg, Germany

Filed Oct. 2, 1974, Ser. No. 511,255
Claims priority, application Germany, Oct. 18, 1973, 2352289
Int. Cl.² B65G *15/60*
U.S. Cl. 198—204 **19 Claims**



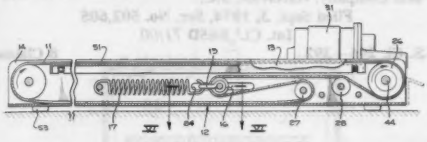
1. In a conveyor, particularly a scraper conveyor, a combination comprising a conveyor trough composed of at least two longitudinally adjacent trough sections having respective side walls and juxtaposed terminal faces; a pair of first connecting members welded to said side walls of one of said sections and recessed longitudinally thereof from the terminal end face of said one section, said first connecting members having convex first end faces directed towards said terminal end face of said one section, and outer surfaces facing away from the side walls of said one section; a pair of second connecting members welded to said side walls of the other of said sections and each having an end portion projecting beyond the terminal end face of said other section, said end portions having second end faces each formed with a concave recess in which one of said convex end faces is received, and outer surfaces facing away from the side walls of said other section; substantially keyhole-shaped recessed formed in said outer surfaces and each having a narrow portion with an open end located at the respective end face and a wider portion spaced from the respective end face, each of said narrow portions diverging from the respective wider portion toward the associated end face and said wider portions of said keyhole-shaped recesses in said first connecting member being of substantially circular outline; and coupling elements received in said keyhole-shaped recesses and each having two enlarged end sections received in the wider portions of said adjacent keyhole-shaped recesses of

said first and second connecting members and a narrow section received in said narrow portions of said cooperating recesses, said enlarged end sections received in said wider portions of said keyhole-shaped recesses in said first connecting members having an outer surface substantially matching said circular outline so that said trough sections are connected against separation in longitudinal direction but can be tilted relative to one another to a limited extent in vertical and horizontal direction.

3,946,861
CONVEYOR ASSEMBLY

Douglas M. Sandefur, 14507 S. Hawthorne Blvd., Lawndale, Calif. 90260

Filed Dec. 16, 1974, Ser. No. 533,076
Int. Cl.² B65G *15/30*
U.S. Cl. 198—208 **13 Claims**



12. A conveyor assembly comprising:

a frame having a plurality of vertical side members on both sides and a plurality of coupling bars for coupling adjacent vertical side members to maintain them in a uniform plane in their respective associated sides,

an endless belt mounted on said frame to permit said vertical members to guide the forward and reverse movement of said belt,

a spring loaded belt tension roller mounted in slots in a pair of vertical members on opposite sides of said frame for maintaining said belt taut,

a slide surface removable from the top of said frame to provide ease of access to said tension roller and ease of threading of said endless belt around said tension roller,

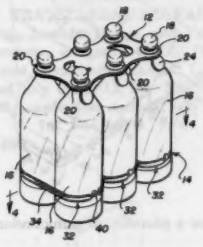
a drive roller mounted on a single roller bearing on one of said vertical members and a drive motor coupled to said drive roller on the opposite vertical member with said drive roller mounted at one end of said frame and said belt tension roller mounted at some intermediary position between the ends of said frame to thereby maintain the length of said conveyor assembly constant regardless of the stretching of said endless belt, and wherein said single roller bearing has an inner race mounted on a bolt having two arcuate surfaces adapted to be threaded through a hole in one of said vertical members and secured thereto by a threaded nut to maintain the inner race stationary while permitting the outer race of said roller bearing to rotate on said roller bearing.

3,946,862
CONTAINER PACKAGE

Mindaugas Julius Klygis, Evergreen Park, and Ronald C. Owen, Harwood Heights, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed July 16, 1974, Ser. No. 488,983
Int. Cl.² B65D *75/28*
U.S. Cl. 206—150 **2 Claims**

1. A supplementary carrier member for a container package of the type described comprising a plurality of containers arranged in groups of at least two containers with the containers in each group being in abutting relationship with each other and in substantially abutting relationship with containers in adjacent groups, said carrier member comprising a sheet material member having a plurality of parallel slits extending between and terminating short of opposite margins of the member and defining a band portion having opposite side sections and opposite end connecting sections, said member including uninterrupted connecting areas joining adjacent band portions at locations substantially inwardly from opposite margins of the member, slit means extending from adjacent said opposite margins substantially to said uninterrupted areas for separating adjacent band portions from each other, and each of said band portions having a circumferential extent for encircling all of the containers in one of said group of containers, said sheet material member including rupturable

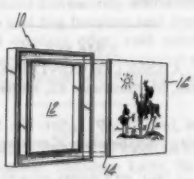


connecting elements between the opposite side sections of each of said band portions and interrupting said slits and additional rupturable connecting elements between adjacent band portions adjacent opposite margins of said member for facilitating handling of said member prior to assembly with the containers, said rupturable connecting portions being rupturable for permitting manipulation of the band portions for assembly with the containers.

3,946,863
FRAME BOX

Norman Glasband, 47 Stoneham Drive, West Hartford, Conn. 06117, and Hyman S. Glasband, 80 Braintard Road, West Hartford, Conn. 06114

Filed Nov. 27, 1974, Ser. No. 527,639
Int. Cl.² B65D *3/00, 77/00*
U.S. Cl. 206—216 **4 Claims**



1. A package comprising:

an outer box, said outer box including a planar base portion and side wall defining means extending transversely from a first side of said base portion about the periphery thereof;

means defining an inner box, said inner box defining means being secured to said first side of the base portion of said outer box and having a cross-sectional area less than the cross-sectional area of said outer box, said inner box including side wall defining means extending parallel to said outer box side wall defining means, a channel being defined between said inner and outer box side wall defining means, said outer box, said inner box and said channel cooperating to form a shadow frame for a work to be displayed; and

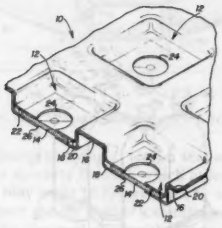
a removable cover for said inner box.

3,946,864

SEMICONDUCTOR CHIP PACKAGE

Jearld L. Hutson, 2019 W. Valley View Lane, Dallas, Tex. 75234

Filed July 1, 1974, Ser. No. 484,671
Int. Cl.² B65D *85/30*
U.S. Cl. 206—332 **2 Claims**



1. A package for a plurality of semiconductor chips comprising:

a plurality of semiconductor chips each having opposed gate regions,

first and second transparent plastic sheets each having an array of depressions formed therein, said sheets being adjacently disposed and said depressions of said first sheet nested with said depressions of said second sheet to form a plurality of discrete compartments between said sheets and spaced from the plane of said sheets, each of said compartments being dimensioned to contain one of said semiconductor chips and to allow visual inspection of said chips,

means for attaching said sheets about the peripheries thereof with a permanent bond,

structure defining apertures through each of said plastic sheets in the region of each of said compartments,

said apertures being aligned and centrally disposed relative to said depressions and being oriented adjacent said gate regions to enable electrical testing of said chips,

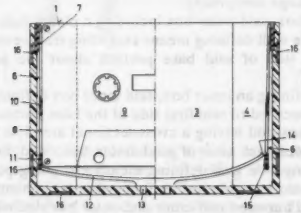
said apertures being smaller than said chips to constrain said chips within said compartments while allowing access to said chips through said apertures to enable electrical testing of the chips.

3,946,865

CASSETTE CONTAINER

Reinhard Bierwas, Marktstrasse 42, Huttental-Geisweid, Germany

Filed Jan. 24, 1975, Ser. No. 543,684
Claims priority, application Germany, Jan. 25, 1974, 7402445[U]
Int. Cl.² B65D *85/672*
U.S. Cl. 206—387 **23 Claims**



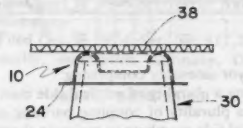
1. A container of plastic material suitable for receiving a compact cassette of recording tape, comprising a shallow box of rectangular form having an opening in one of its longer sides through which the cassette can be introduced into the box, each of the two shorter sides of the box having a leaf spring associated with the internal wall thereof, the springs being resiliently secured to the wall adjacent the open side of the box and each spring having a pair of detent surfaces thereon in spaced apart relation, such that, when a cassette is inserted completely into the box, the detent surfaces of each spring engage opposite ends of a guide bar on the adjacent side edge of the cassette to retain the cassette in the box, and a pressure spring is provided on the internal surface of the longer side of the box which faces said opening to be engaged by the cassette.

3,946,866

CONE NOSE PROTECTOR

Richard W. Turnage, Hartsville, S.C., assignor to Sonoco Products Company, Hartsville, S.C.

Filed Sept. 3, 1974, Ser. No. 502,605
Int. Cl.² B65D *71/00*
U.S. Cl. 206—392 **8 Claims**



6. A shipping container for packages of yarn wound on conical members comprising:

a container having sides and a bottom;

a plurality of yarn packages wound on cones and randomly disposed in said container;

nose cone protectors on the nose of said cones;

said nose protectors having a conical side portion wherein one end is of smaller diameter than the other end and a hemitoroidal portion extending from said smaller end portion and inwardly thereof to provide resilient attachment of said protector to the nose of said cone; and

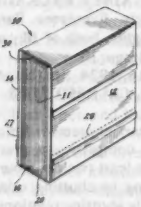
said conical side being adapted to space said hemitoroidal portion above the axial end of the nose of said cone.

3,946,867

BOOK HAVING A SECURITY COVER

John V. McGuire, Deerfield, and Robert L. Mitchell, Libertyville, both of Ill., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 27, 1975, Ser. No. 562,625
Int. Cl.² B65D *65/14, 65/28*
U.S. Cl. 206—450 **8 Claims**



1. A covered book, comprising:

a. a stack of aligned sheets providing an edge surface;

b. a first protective sheet located adjacent the first sheet of the stack;

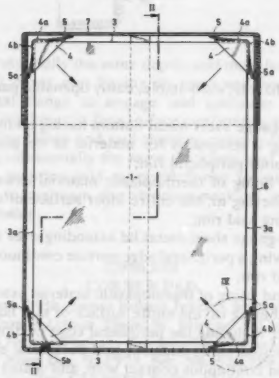
c. a second protective sheet located adjacent the last sheet of the stack and said first protective sheet;
d. an adhesive binding strip fixed to the sheets along said edge surface and to the outside of the protective sheets; and
e. means for fixing the first protective sheet to the second protective sheet.

3,946,868

PACKAGE CONTAINING A STACK OF FLEXIBLE SHEET MATERIAL

Peter William Rutter, Ilford, England, assignor to Ilford Limited, United Kingdom

Continuation-in-part of Ser. No. 255,480, May 22, 1972, abandoned. This application Oct. 29, 1974, Ser. No. 518,931
Claims priority, application United Kingdom, June 1, 1971, 18294/71
Int. Cl.² B65D *25/12, 85/48*
U.S. Cl. 206—455 **6 Claims**



1. A package, comprising:
a stack of easily scratchable flexible sheets of light-sensitive material;
a light-tight folder enclosing said stack;
a rigid box open at one end thereof and having a bottom wall, two major frontal walls opposite one another, and two minor intermediate side walls joining said frontal walls, and a lid having an open end fitting over said open end of said box and a top wall covering the open end of the box, said box being so dimensioned as to enclose said stack so tightly that said stack is preventing from buckling;
four corner pieces, each of said corner pieces being constructed of strong material and embracing one of the four small vertical edges of the stack at right angles to the plane of the sheets forming the stack and extending over the corner portions of both large side faces of the stack to form a tight fit thereon, each of said corner pieces being so dimensioned as to permit the side walls of said box to lie tightly against said light-tight folder enclosing said stack of easily scratchable flexible sheets, thereby preventing movement of the sheets in the stack relative to one another; and
four spring means, one each engaging one of said four corner pieces at the outside thereof and urging said respective corner piece toward a diagonally opposite corner piece, first and second of said spring means engaging respective first and second of said corner pieces located in two inner corners of said box, each said first and second spring means including a first resilient part resting on said bottom wall of said box and a second resilient part resting on an adjacent said side wall of said box, third and fourth of said spring means engaging respective third and fourth of said corner pieces located in two inner corners of said lid, each of said third and fourth spring means including a first resilient part resting on an adjacent said side wall of said box and a second resilient part resting on said top wall of said lid when said lid is in a fully closed position over said open end of said box, said lid thereby comprising means, when in said fully closed position, for fully tensioning said spring means and for holding said stack in an elastically suspended position in said box.

3,946,869

TRANSPARENT PACKAGE

Helmut Grottrup; Joachim Hoppe, and Yahya Haghiri, all of Munich, Germany, assignors to G.A.O. Gesellschaft fur Automation und Organisation m.b.H., Germany

Filed July 19, 1973, Ser. No. 380,616
Claims priority, application Austria, July 26, 1972, 6424/72
Int. Cl.² B65D *73/00*
U.S. Cl. 206—466 **7 Claims**

1. A package comprising a relatively stiff substantially rectangular board having top, bottom and two side edges with said top and bottom edges being of smaller dimension than said side edges, a transparent substantially rectangular bag of a size smaller than said board having a straight top edge and a top marginal area adjacent said top edge secured on its underside to said board and having an open edge on its top side parallel to and spaced from said top edge, said board having an engagement recess for engagement by a driver to move said package, and a narrow single collar formed in said board along said top edge of said board and spaced inwardly from said side edges and being folded downwardly into abutting engagement with and sealed to said bag between said straight top edge of said bag and said opening edge, said narrow single collar having straight lower edge extending across said bag forming a severing edge along which said bag may be turn.

3,946,870

COLLAPSE-RESISTANT PAPERBOX PACKAGING

Israel Gajer, Levittown; Theodore Licht, St. James, both of N.Y., and Harold Goodman, Lexington, Mass., assignors to Jameco Industries, Inc., Wyandanch, N.Y.

Filed Feb. 6, 1975, Ser. No. 547,699
Int. Cl.² B65D *5/38, 13/08, 65/02, 73/00*
U.S. Cl. 206—471 **4 Claims**

1. Collapse-resistant paperbox packaging for small articles, such as plumbing parts and accessories, hardware, tools and other pre-packaged products, said collapse-resistant paperbox packaging comprising:

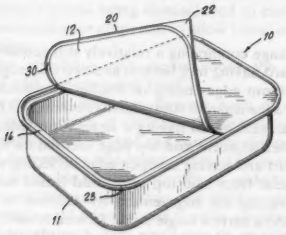
a. an outer shell and an inner sleeve removably encased in said outer shell,
b. said inner sleeve consisting of a generally rectangular corrugated paperboard base having a pair of side flanges extending upwardly therefrom and a transparent plastic skin securing at least one article to said corrugated paperboard base, between said side flanges,
c. said outer shell consisting of a generally rectangular paperbox having top and bottom walls joined by a pair of side panels,
d. said inner sleeve being disposed within said outer shell between said top and bottom walls and between said side panels of the paperbox juxtaposed,
e. whereby said inner sleeve reinforces the outer shell and resists collapse of said outer shell under conditions of normal use and abuse,
f. said corrugated paperboard base being provided with a pair of end flanges, in addition to its side flanges, and
g. said paperbox being provided with a pair of end flaps, in addition to its side panels,
h. said end flanges and said end flaps being juxtaposed to further reinforce the outer shell and resist its collapse.

3,946,871

SEALABLE AND STERILIZABLE PACKAGE

Winfried Gerhard Sturm, Goldach, Switzerland, assignor to Alcan Aluminum Corporation, Cleveland, Ohio

Filed Sept. 27, 1974, Ser. No. 509,746
Int. Cl.² B65D *51/20, 85/72*
U.S. Cl. 206—498 **10 Claims**



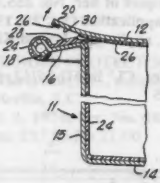
1. A sterilizable, shelf-stable, easily openable package comprising:
a. a light-gauge sheet metal bottom having an inner surface defining a receptacle for material to be packed and a continuous peripheral rim;
b. a first lining of thermoplastic material extending over, and adhering to, the entire inner surface of said bottom including said rim;
c. a light-gauge sheet metal lid extending over said bottom and having a peripheral edge portion continuously overlying said rim;
d. a second lining of thermoplastic material extending over, and adhering to, the entire surface of said lid facing said bottom, including the peripheral edge portion thereof,
e. a portion of said second lining adjacent said peripheral edge portion of said lid being in continuous contact with, and sealed to, the portion of said first lining at said rim, around the entire periphery of the package;
f. said second lining consisting of a thermoplastic material which effectively and reliably adheres to the metal surface of the lid and to said first lining at temperatures up to at least about 120° C and which forms with the first lining a seal that opens evenly and completely by defoliation of only said last-mentioned portion of said second lining from said lid when the lid is peeled manually from the bottom,
g. the material of said second lining being different in composition from, and lower in bond strength than, the material of said first lining.

3,946,872

SEALABLE AND STERILIZABLE PACKAGE

Winfried Gerhard Sturm, Goldach, Switzerland, assignor to Alcan Aluminum Corporation, Cleveland, Ohio

Filed Sept. 27, 1974, Ser. No. 509,747
Int. Cl.² B65D *51/20, 85/72*
U.S. Cl. 206—498 **17 Claims**



1. A sterilizable, shelf-stable, easily openable package comprising:
a. a light-gauge sheet metal bottom having an inner surface defining a receptacle for material to be packed and a continuous peripheral rim;
b. a first lining of thermoplastic material extending over, and adhering to, the entire inner surface of said bottom including said rim;
c. a light-gauge sheet metal lid extending over said bottom and having a peripheral edge portion continuously overlying said rim;
d. a second lining of thermoplastic material extending over, and adhering to, the entire surface of said lid facing said bottom, including the peripheral edge portion thereof,
e. said second lining adjacent said peripheral edge portion being in continuous contact with, and sealed to, the portion of said first lining at said rim, around the entire periphery of the package;
f. each of said linings consisting essentially of the cured product of a vinyl resin based lacquer composition which is resistant to attack by food acids and salt and has a melting range above about 125° C and which forms with the other lining a seal that parts by defoliation from the lid when the lid is peeled manually from the bottom,
g. said linings being respectively constituted of different compositions having respectively different bond strengths such that the second lining peels more readily from the lid than the first lining peels from the bottom.

3,946,873

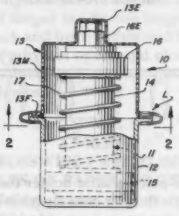
AB-TYPE PISTON ASSEMBLY SHIPPING COVER

Robert W. MacDonnell, Crete, Ill., assignor to Unity Railway Supply Co., Inc., Chicago, Ill.

Continuation of Ser. No. 273,219, July 19, 1972, abandoned.
This application July 5, 1974, Ser. No. 485,970
Int. Cl.² B65D *81/02*
U.S. Cl. 206—521 **3 Claims**

1. A composite shipping package comprising, in combination:
an AB type railroad air brake piston assembly, a dual purpose shipping cover engaging a container component to provide a container for said piston assembly, and locking means for maintaining said shipping package in assembled relationship;
said AB piston assembly including a sleeve, a piston, a head having a stepped diameter free end and spring means biasing said piston and said head apart; said container component comprising an air brake cylinder including a

cylindrical main body having a circular open end bordered by an outboard mounting flange, said mounting flange having a generally rectangular profile; said shipping cover comprising a body of stepped diameter having a main length portion cooperating with and enclosing said piston and a reduced end portion cooperating with and enclosing the free end of said head, said main length portion of said cover and said container component having substantially the same depth, said main length portion of said cover also having an open end bordered by a marginal flange to engage said container component mounting flange in face-to-face confronting relation, said mounting flange and said shipping cover marginal flange having substantially the same thickness; and said locking means securing said marginal flange to said mounting flange to maintain the shipping package in assembled relationship.

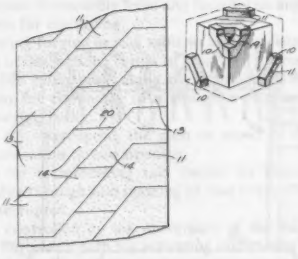


3,946,874

CORNER PAD

Ralph Gilbert Breth; James Robert Jenkins, both of Minneapolis, and James Arthur Thole, St. Michael, all of Minn., assignors to Federal Package Corporation, Minneapolis, Minn.

Filed Dec. 9, 1974, Ser. No. 530,589
Int. Cl.² B65D *81/04, 85/30*
U.S. Cl. 206—523 **10 Claims**



1. A blank for use in fabricating a resilient corner pad comprising.

a sheet of yieldable material having a plurality of identical V-shaped units arranged thereon,

each unit so designed and constructed so that substantially all of the sheet is utilized,

said units each comprising a base and an arm with the arm disposed at an obtuse angle to the base,

said base having a longitudinal dimension and said arm having a longitudinal dimension,

the longitudinal dimension of the arm and the longitudinal dimension of the base being identical,

said base having a transverse dimension and said arm having a thickness dimension,

the transverse dimension of the base and the thickness dimension of the arm being identical.

7. A corner pad of hollow, frusto-conical, triangular, pyramidal configuration comprising

three identical V-shaped elements formed of relatively thick, resilient material,

each of said elements having a base and an arm at an obtuse angle thereto and a thickness,

the end of each of said arms being flatly in contact with the face of the base of an adjacent element,

all of said arms being disposed to form, with adjacent bases of elements in contact with faces of adjacent arms

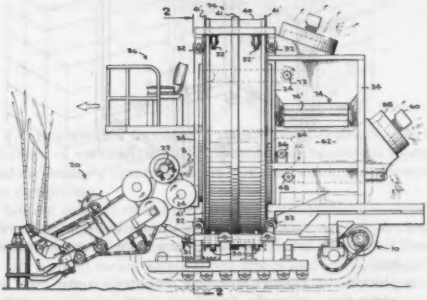
a continuous hollow, truncated, frusto-conical, triangular, pyramidal shock-absorbing member.

3,946,875

FIELD OPERATED CANE CLEANING APPARATUS

Larry G. Fowler, Belle Glade, Fla., assignor to Sugar Cane Growers Cooperative of Florida, Belle Glade, Fla.

Filed Aug. 26, 1974, Ser. No. 500,654
Int. Cl.² B07B *13/10*
U.S. Cl. 209—115 **9 Claims**



1. A vehicle mounted cane loader-cleaner device for receiving relatively short cane segments hurled from a cane chopping segmentizer means, removing trash from the cane segments and conveying the clean cane segments to a discharge conveyor for deposit into an accompanying receiving trailer vehicle or the like, said loader-cleaner including frame means supporting rotary drum support means, segmentizer means from which plural cane segments are ejected in a rearward line of flight with respect to said vehicle, an open-ended cleaner drum mounted for rotation about a horizontal axis on said rotary drum support means and positioned rearwardly of and adjacent said segmentizer to receive cane segments from said segmentizer, said cleaner drum including inwardly facing pockets defined by an outer cylindrical wall, first and second radially extending end walls joined to said outer cylindrical wall along opposite edge portions thereof and equidistantly spaced lift plates extending inwardly from said outer cylindrical wall between and perpendicular to said end walls so that the space between adjacent lift plates, portions of the end walls and the outer cylindrical wall between said adjacent lift plates defines individual ones of said inwardly facing pockets, means for drivingly rotating said cleaner drum about a horizontal axis so that said inwardly facing pockets move in a circular path, deflector means positioned internally of said rotary cleaner drum in the line of flight of said cane segments for deflecting cane segments hurled from said segmentizer into the pockets of said drum in the lower portion of said drum so that continued rotation of said drum lifts the cane segments upwardly to upper portions of the drum from which the segments fall to provide a cascade of cane, second stage trash removal blower means for creating an upper front to rear airflow through said drum across said falling cascade of cane segments above said deflector means for removing trash particles from said cane segments, a cane removal conveyor extending into said cascade of falling cane segments for receiv-

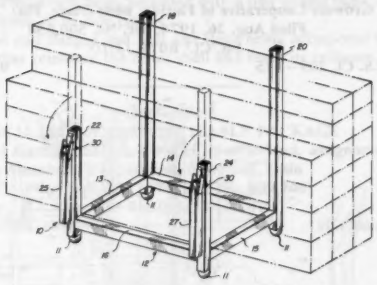
ing said cane segments and conveying said cane segments rearwardly outwardly of said rotary cleaner drum, discharge conveyor means receiving said cane segments from said cane removing conveyor for conveying said cane segments to a receiving trailer, vehicle or the like and infeed trash removal blower means for creating a lower front to rear airflow through said drum across the line of flight of infeed cane hurled from said segmentizer.

3,946,876

HINGED POST STORAGE RACK

Richard S. Jay, Evanston, Ill., assignor to Jarke Corporation, Chicago, Ill.

Filed Mar. 18, 1974, Ser. No. 451,801
Int. Cl.² B65D *19/44*
U.S. Cl. 211—60 R **6 Claims**



1. A storage rack providing a vertically oriented storage well for storing articles therein, comprising in combination,

a base,

a plurality of support members mounted on said base and extending upwardly therefrom, said support members forming front and rear support means for articles stored within the rack,

each of said support members provided with an extension member,

hinge means for pivotally hinging each of said extension members to a corresponding support member and accommodating the pivotal movement of each of said extension members throughout an arc of 180° relative to said support members,

said hinge means formed by a pivot pin horizontally mounted on each of said support members adjacent the upper portion thereof,

each of said extension members including a pair of side plates mounted thereon in opposed relation adjacent the lower end thereof,

each of said side plates being mounted horizontally offset with respect to each of said extension members,

the offset portion of each of said side plates provided with a vertical slot therein,

said pivot pin mounted on said front support member extending beyond the side edges of said corresponding support member for a short distance sufficient for constrained alignment with each of said slots provided in said side plates of said extension member,

lock means for lockingly engaging each of said extension members in vertical alignment with said corresponding support members thereby to present an increase of vertical height for each of said support members thereby to increase the overall vertical storage well of said storage rack,

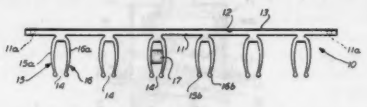
whereby the hinge movement of said extension member with respect to said support member is accomplished by the movement of said pivot pin within the slotted confines of said slot and said side plate thereby to permit the arcuate pivotal movement of said extension member throughout an arc of 180° into vertical alignment with said support member.

3,946,877

CLIP-TYPE HOLDER FOR TOOTHBRUSHES OR THE LIKE

Virgil René Galicia, P.O. Box 147, Great Neck, N.Y. 11022

Filed Nov. 12, 1974, Ser. No. 523,053
Int. Cl.² A47F *5/08*
U.S. Cl. 211—65 **3 Claims**



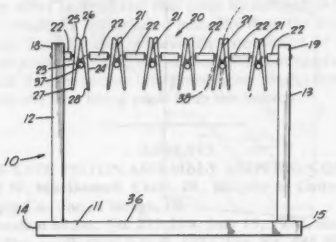
2. A molded one-piece plastic holder for toothbrushes and the like comprising a flexible base strip having a pressure-sensitive adhesive coating on its back side for releasably holding the base strip by adhesive grip to a supporting wall, a plurality of sets of coacting clip fingers on the forward side of said base strip formed integrally therewith, the clip fingers of each set having narrow, outwardly-flared tips enabling a handle of a toothbrush when held at right angles to said fingers to be pressed therebetween, and having outwardly-bowed central portions for gripping said handle with a clamping pressure and holding the same releasably therebetween, wherein said adhesive coating is protected by a flexible releasable liner when the holder is not in use, including means on said holder for removably retaining said liner thereto after its removal from said adhesive coating for reapplication over said adhesive coating after the holder is stripped from a wall surface, said liner being permanently secured to one end of said holder.

3,946,878

MESSAGE HOLDER RACK

James N. Stoveken, and Mary L. Glokner, both of Belle Mead, N.J., assignors to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Dec. 30, 1974, Ser. No. 537,203
Int. Cl.² A47H *13/00*
U.S. Cl. 211—124 **2 Claims**



1. A message holder rack adapted to hold a plurality of pieces of paper, which comprises:

a. an elongated base;

b. a pair of upwardly extending columns affixed to an upper surface at each end of said base, an upper portion of each said column having a transverse aperture therethrough;

c. a clip assembly consisting of conventional clothespin clips and cylindrically shaped members arranged in an alternate sequence, two said cylindrically shaped members forming the outerends of said clip assembly, said clothespin having two companion parts joined together at their median portions with a spring assembly, each said companion part having a finger grip end and a jaw grip end,

each said cylindrically shaped member having a longitudinal opening in each end of said cylindrically shaped member;

d. a bearing assembly contained in each said longitudinal opening of said cylindrically shaped member;

e. a plurality of L-shaped wires, each said wire having a longer and a shorter leg, said shorter leg and an inner portion of said longer leg of each said wire embedded in said grip end of each said companion part, a free end of said longer leg of each said wire rotatably contained in one said bearing assembly in one said cylindrically shaped member, said longer leg having longitudinal freedom of movement back and forth within said bearing assembly as each said jaw grip end opens and closes; and

f. a means for joining said clip assembly to said upwardly extending columns.

3,946,879

DEVICE FOR CROSSWISE LAYING OF RECTANGULAR BUNDLES OF PAPER, OR THE LIKE

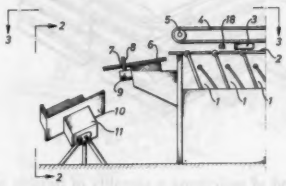
Fredrik Jensen, Malaga, Spain, assignor to Lindaco Ltd., Geneva, Switzerland

Filed Aug. 21, 1974, Ser. No. 499,160

Claims priority, application Sweden, Sept. 26, 1973, 7313140

Int. Cl.² B65G 57/22

U.S. Cl. 214—6 N **10 Claims**



3. A device for crosswise stacking of rectangular bundles of paper or the like comprising

means for uniformly conveying the bundles along a substantially horizontal path,

an inclined table having one upstream end in the vicinity of the ending downstream point of said horizontal path and inclined downwardly from and forming an angle with said means for conveying,

an opening formed in said table in an area distant from the path of travel of the center of gravity of the bundles as the bundles freely slide along said inclined table from said means for conveying in a straight continuation of said conveying path,

means for interrupting the path of travel of the bundles, reciprocation in said opening,

means for reciprocating said means for interrupting the bundles through said opening so that every other bundles is interrupted,

means controlled by the movement of the bundles along said horizontal path for activating said means for reciprocating,

a gathering hopper below said inclined table, comprising a face plate having a front upstream edge in the vicinity of the downstream end of said table,

said hopper being inclined downward and forming an angle with a horizontal plane partly in the direction of said collecting path and partly in a direction transverse to last mentioned direction, said hopper further comprising two abutments, one abutment formed on each of the two lowermost edges of said front plate, said abutments being arranged perpendicular to each other,

the distance between said interrupting means and said path of travel of the center of gravity of the bundles being arranged such as to cause said every other bundle to unobstructedly rotate substantially 90° during its movement between said interrupting means and said hopper.

3,946,880

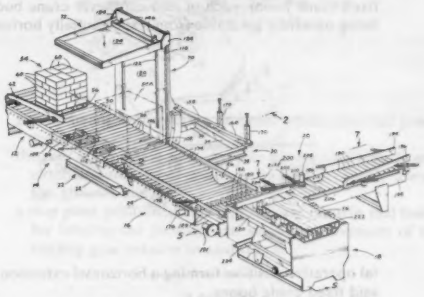
APPARATUS FOR DISASSEMBLING A LAYERED STACK OF ARTICLES

Robert A. Schmitt, Vancouver, Wash., assignor to Columbia Machine, Inc., Vancouver, Wash.

Filed May 28, 1974, Ser. No. 473,344

Int. Cl.² B65G 59/06

U.S. Cl. 214—8.5 R **16 Claims**



1. Apparatus for receiving a stack of articles disposed in a plurality of vertically stacked, substantially horizontal layers and successively removing layers from said stack, said apparatus comprising

bottom support means operable, in a substantially horizontally disposed first position, to receive and support the underside of a stack of articles,

side support means adjacent one side of said bottom support means having a stack-supporting side operable, in a substantially upright first position, to support an upright side of a stack of articles on said bottom support means,

means pivotally mounting said side support means for swinging about a substantially horizontal pivot axis between its first position and a second, substantially laid-over, position with said stack-supporting surface facing upwardly,

stop means for limiting swinging of said support means whereby when in its second position its stack supporting side is horizontal,

means pivotally mounting said bottom support means for swinging in the direction of said side support means about a substantially horizontal pivot axis between its first position and a second, substantially upright, position,

first powered means for swinging said side support means and bottom support means concurrently from their first to their second positions to lay a stack of articles held by said side and bottom support means over onto its side, and

second powered means for swinging said bottom support means from its second to its first positions independently of said side support means to swing the bottom layer of said stack from an upright position to a horizontal position, while remainder layers of said stack remain in their laid-over positions on said side support means.

3,946,881

TRANSVERSE TRAVELLING CRANE FOR SHIPS

Harald Ludvigsen, Fredrikstad, Norway, assignor to A/S Fredriksstad mek. Verksted, Fredrikstad, Norway

Filed Sept. 30, 1974, Ser. No. 510,859

Int. Cl.² B63B 27/10

U.S. Cl. 214—15 R **5 Claims**

1. In a ship of the type including a main deck, deck railing,

a superstructure, and a transverse travelling crane mounted above said deck, improvement comprising:

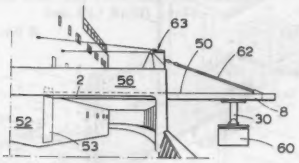
a crane passage extending transversely through said superstructure at a level above said deck;

access openings into said superstructure, on opposite sides thereof at positions below said crane passage;

said transverse travelling crane comprising:

a horizontal crane boom extending through said crane passage and fixed to said superstructure, said fixed crane boom having opposite ends thereof positioned above said railing at opposite sides of said ship;

a pair of cantilever crane booms, one each pivotally supported at respective of said opposite ends of said fixed crane boom, each of said cantilever crane boom being upwardly pivotable from a substantially horizontal operative position forming a horizontal extension of said fixed crane boom;



a load carrying and hoisting carriage mounted for travel along said fixed crane boom, said carriage being movable along said cantilever crane booms when said cantilever crane booms are in said operative positions thereof;

carriage movement means for moving said carriage along said fixed crane boom and said cantilever crane booms and including turning pulleys positioned on the respective outer extremities of said cantilever crane booms, guide pulleys positioned adjacent respective pivot axes of said cantilever crane booms, and a cable connected to said carriage and extending around said turning pulleys and under said guide pulleys.

3,946,882

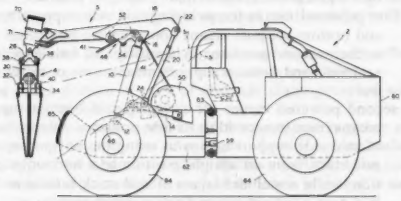
GRAPPLE SKIDDER WITH SELF-CENTERING GRAPPLE SUPPORT MECHANISM

Stanislaus H. Koch, London, Canada, assignor to Clark Equipment Company, Buchanan, Mich.

Filed Mar. 31, 1972, Ser. No. 240,063

Int. Cl.² B66C 1/32

U.S. Cl. 214—147 G **5 Claims**



1. In a grapple skidder vehicle having a front section including drive wheels, a rear section including drive wheels, means for driving the wheels, means interconnecting the front and rear sections for relative pivotal movement between the sections about a substantially vertical axis, the improvement comprising a grapple support boom, a grapple pivotally suspended from said grapple support boom, a grapple centering mechanism carried on the grapple support boom and pivotally supporting said grapple, said grapple centering mechanism including a housing fixed against rotation about the grapple turning axis, first torosional resistance means in said housing having its upper end secured thereto, second torsional resistance means in said housing having its lower end connected to the grapple for pivotal movement therewith, and a yieldable connection means between said first and second torsional resistance means establishing a neutral position of relative angular deflection between said first and second torsional resistance means when the grapple is disposed transversely to the centerline of the vehicle and progressively increasing torsional resistance forces acting on the grapple in either direction from said neutral position regardless of the load being carried by the grapple.

3,946,883

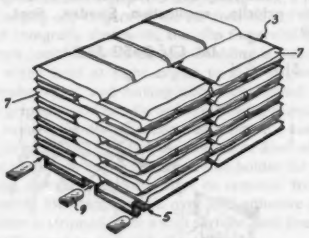
METHOD FOR PALLETIZING

Ira W. Beal, Hudson, Ill., assignor to Funk Seeds International, Inc., Bloomington, Ill.

Filed Sept. 10, 1973, Ser. No. 395,588

Int. Cl.² B65G 1/16

U.S. Cl. 214—152 **2 Claims**



1. A method of palletizing a plurality of flexible bags containing flowable material on an expendable pallet and into a unitized load for handling by a fork lift truck and for stacking, comprising the steps of forming a flexible blank into a pallet having (a) sections defining a central channel, (b) a trough on either side of said central channel extending parallel thereto, (c) wings extending outwardly from the troughs, and (d) flaps also extending outwardly from the wings wherein the pallet is set up on the bottom of an open sided box, forming the central channel and forming the troughs in the bottom of the box, filling the troughs with the bags, folding the flaps over bags in the troughs, and stacking additional bags over the flaps, whereby said pallet and said bags become interlocked to form a unitized load for handling by a fork lift truck.

3,946,884

METHOD FOR TRANSPORTING TEXTILE YARN PACKAGES

Takashi Kato, Kariya; Toshio Yoshizawa, Chiryu; Yoshihisa Suzuki, Nagoya, and Shozo Ueda, Kariya, all of Japan, assignors to Kabushiki Kaisha Toyoda, Jidoshokki Seisakusho, Aichi and Daiwa Boseki Kabushiki Kaisha, Osaka, both of Japan

Filed Jan. 23, 1974, Ser. No. 435,948

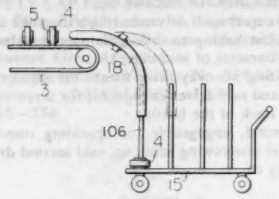
Claims priority, application Japan, Jan. 23, 1973, 44-9662; May 17, 1973, 45-55027; June 26, 1973, 45-72066

Int. Cl.² B65G 57/26

U.S. Cl. 214—152 **8 Claims**

1. Method for transporting yarn packages formed on cylindrical tubes in a plurality of spinning units in a textile machine to another processing area comprising, doffing yarn packages from said spinning units directly to a common conveyor belt disposed adjacent to said textile machine, with the axes of said tubes parallel to the transport direction of said belt, transferring said yarn packages from a terminal portion of said con-

veyor belt to a receiving rod by inserting said receiving rod into the cylindrical tube of each yarn package, and displacing



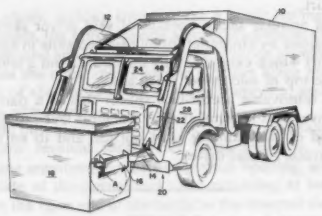
said receiving rod to move the package to the other processing area.

3,946,885

CAB FOR WASTE COLLECTION VEHICLE

John P. Menkel, Jr., and Stewart N. Metz, both of Tulsa, Okla., assignors to Crane Carrier Company, Tulsa, Okla.

Filed July 8, 1974, Ser. No. 486,469
Int. Cl.² B65F *3/02*
U.S. Cl. 214—302 **4 Claims**



1. In a vehicle carrier having:
a forward drive-operated enclosed cab, said calb having sides, a steering column, dashboard, floorboard, seat for said driver operator therebehind and forward windshield,
a carrier portion disposed rearwardly of said cab, and
means to pick up goods immediately forward of said cab and deliver said goods over said cab and rearwardly to said carrier portion, the improvement in said cab comprising:
a transparent port at the forward most portion of said cab on the driver operator's side and positioned in the area defined above said floorboard and below said windshield, and between said steering column and said side of said vehicle and
said dashboard extends from about an imaginary vertical plane of said steering column toward the center of said cab, whereby a cone of vision to said means to pick up said goods is provided said driver operator from his normal seated position downwardly and forwardly of said cab, with the lateral sides of the cone of vision at said port being bordered by the operator driver's side of the cab and the operator driver's end side of the dashboard.

3,946,886

TOWING DEVICE FOR SMALL PLANES AND THE LIKE

Harold R. Robinson, Des Moines, Iowa, assignor to David B. Hawkins, Des Moines, Iowa, a part interest

Division of Ser. No. 371,262, June 18, 1973, abandoned. This application Dec. 16, 1974, Ser. No. 532,813
Int. Cl.² B60B *29/00*
U.S. Cl. 214—334 **8 Claims**

1. A tow device for small planes and the like having a landing gear comprising:
a frame having front and rear ends and opposing sides;
front and rear wheels rotatably mounted on said frame;
a power cylinder pivotally connected to said frame for movement in a vertical plane;
an extensible piston slidably mounted in said cylinder for reciprocating movement therewith;
strap means pivotally mounted on said piston for connection to the landing gear of the plane;

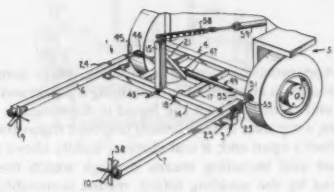
power means for powering said rear wheels and said power cylinder;
the rear end portion of said frame having an inclined ramp extending therefrom downwardly and rearwardly toward the ground; and
a stop plate positioned forwardly of said ramp in said frame for limiting the forward and sideways movement of the landing gear relative to said frame.

3,946,887

BALE HANDLING APPARATUS

Gary D. Parker, Moran, Kans. 66755

Filed Dec. 26, 1974, Ser. No. 536,637
Int. Cl.² B66F *9/18*
U.S. Cl. 214—653 **8 Claims**



1. A bale handling apparatus comprising:
a. a frame structure having a beam extending transverse to the direction of travel of the frame structure and having opposite end portions and an upstanding member on said beam intermediate said ends;
b. means on said beam and upstanding member for connecting same to an implement hitch of a prime mover with the hitch being operable for raising, lowering and tilting said beam;
c. a pair of laterally spaced elongated arms each having an intermediate portion thereof swingably mounted on a respective one of the opposite end portions of said beam, said arms each having a leading end portion and a trailing end portion extending in opposed relation to said beam;
d. means mounted on the trailing end portion of each of said arms for engaging a respective end portion of a hay bale;
e. extensible means having opposite ends thereof each connected to the leading end portion of a respective one of said arms for selectively effecting swinging movement of the trailing end portions of said arms toward and away from each other with the movement toward each other urging the bale engaging means into clamping engagement with the hay bale, said beam being between such bale and said extensible means;
f. the swingable mounting of the intermediate portion of each of said arms on a respective one of the opposite end portions of said beam include:

1. a saddle member mounted on the respective opposite end portion of said beam, said saddle member having an upper portion having the respective arm in sliding engagement therewith;
2. a stop member mounted on said beam and positioned in engagement with said saddle member; and
3. an upstanding ear extending upwardly from the upper portion of said saddle member and positioned to be engaged by said respective arm to limit swinging movement of the trailing end portions of said arms toward each other.

3,946,888

ARTIFICIAL BABY FEEDING

Shirley Lyford Tonkin, 27 Eastbourne Road, Auckland 5, New Zealand

Filed Dec. 7, 1973, Ser. No. 422,847
Claims priority, application New Zealand, Dec. 7, 1972, 169254
Int. Cl.² A61J *9/00*
U.S. Cl. 215—11 B **5 Claims**

1. Apparatus for nursing a suckling infant comprising in combination a container for containing a liquid and having an open end through which the liquid is dispensed as the infant suckles; a separate cover element disposed transversely of said container's open end; a teat element axially above said cover element and including means through which the liquid is received by the suckling infant; means removably retaining the container, cover element and teat element in assembled relationship; means for venting the interior of said container to the atmosphere as liquid is withdrawn by the suckling infant, said cover element comprising a disc including an aperture through which liquid flows from the container to the teat element as an infant suckles, said disc including a one-way valve comprising a displaceable flap juxtaposed on the side of said disc adjacent the teat element, said flap including a valve portion normally overlying said aperture for permitting liquid to flow thereby only from the container to the nipple element and preventing reverse liquid flow back to the container from the nipple element, said means for venting the interior of said container to the atmosphere comprising an air passage means formed between cooperating portions of said container and said cover element and comprising at least one groove portion in a washer positioned between said container and said cover element.

3,946,889

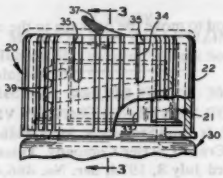
TAMPER INDICATING CHILD RESISTANT CLOSURE

Peter P. Gach, Evansville, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.

Filed Mar. 5, 1975, Ser. No. 555,684
Int. Cl.² B65D *85/56;* **A61J** *1/00;* **B65D** *55/02*
U.S. Cl. 215—219 **11 Claims**

1. A tamper indicating, child-resistant closure for a medicine bottle or the like having a threaded neck, said closure consisting of:

a. an inner, cup-shaped cap having an annular skirt that is internally threaded to mate with the threaded neck of the bottle and a disc-like circular top,
b. an outer cup-shaped driver having a disc-like top and an annular skirt having an inside diameter greater than the exterior diameter of said cap skirt,
c. co-operating one-way drive means on adjacent parts of said cap and said driver engageable for screwing said cap onto the neck of the bottle,
c. and second, engageable, co-operating one-way drive means for unscrewing said cap, said second drive means consisting of



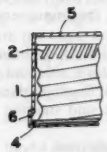
1. at least one abutment on the outer surface of said cap skirt,
2. an annular sector-portion of said driver skirt that is defined by circumferentially spaced slots in said driver skirt which extend axially upwardly from a level below the top of said driver skirt; and
3. a removable sector-like spacer that is a part of said driver that is connected by frangible webs to the upper end of said annular skirt portion and to an adjacent portion of said driver.

3,946,890

CHILD PROOF CLOSURE

Vincent Scuderi, 84 Robbins Drive, East Williston, N.Y.

Continuation-in-part of Ser. No. 548,907, Feb. 11, 1975. This application June 9, 1975, Ser. No. 584,735
Int. Cl.² B65D *55/02, 55/56;* **A61H** *1/00*
U.S. Cl. 215—220 **2 Claims**

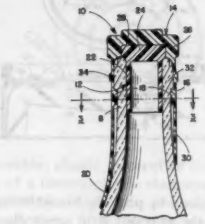


1. A child proof closure for containers having a threaded neck comprising:
a screw type cap, having a lower outwardly extending lip,
a first set of teeth on the side of said cap, said teeth being set at an angle to the axis of said cap,
a drive member loosely mounted on said cap for limited axial motion, said drive member having an interior slot around its lower periphery said slot engaging said lip so as to permit axial movement of said drive member on said cap,
a second set of teeth on said drive member, said teeth being angled in the same direction as said first set of teeth,
whereby when said drive member is turned in the direction to remove the cap, the interaction of said teeth lifts the drive member relative to the cap and the first and second sets of teeth disengage so that the cap cannot be removed solely by turning.

3,946,891
SAFETY CAP FOR PRESSURIZED BOTTLES

Anthony R. Picoy, 15340 Lemac St., Van Nuys, Calif. 91406, and Osvaldo Santos, Ing. Gillermo Marconi 2470 Olivos PC1A, Buenos Aires, Argentina

Filed Apr. 7, 1975, Ser. No. 565,627
Int. Cl.² B65D *41/48*
U.S. Cl. 215—256 **10 Claims**



10. A plastic locking structure for a bottle having pressurized contents, the bottle having a generally tubular neck open at its upper end and having an annular exterior shoulder facing away from the open end, a sealing member being received in the neck of the bottle to form a seal therewith, said locking structure comprising:

a plastic outer locking portion including a generally tubular flexible resilient section for being disposed, when the sealing member is in the bottle neck opening, around the outside of the bottle neck, and extending at least as far from the open end of the bottle as the external shoulder;

means integrally formed inside of the tubular section defining X circumferentially separated rib portions that extend radially inwardly for engagement with the external shoulder of the bottle neck, X being at least two, each of said rib portions having opposed ends and being separated by a small notch at each of its ends from an end of an adjacent rib portion such that each rib portion is in close proximity at either of its ends to an end of an adjacent rib portion, each rib portion extending approximately Y degrees around the inside of the tubular section, Y being equal to 360° divided by X; and

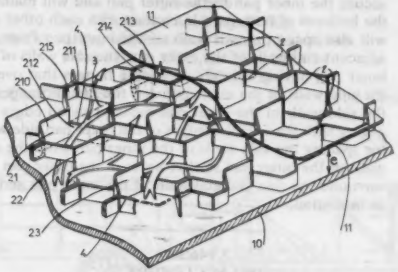
means on the tubular section defining a pull tab portion integrally formed with but separable from the remainder of the tubular section to thereby release the rib portions from their engagement with the annular shoulder of the bottle neck.

3,946,892
DOUBLE WALL VESSEL

Jean Rigal, St. Etienne (Loire), and Jacques Troton, Fraisses, both of France, assignors to Creusot-Loire, Paris, France

Filed Feb. 14, 1972, Ser. No. 225,773
Claims priority, application France, Mar. 12, 1971, 71.08608
Int. Cl. B32b *3/12*; B65d *25/18, 25/00*
U.S. Cl. 220—9 B **6 Claims**

1. Improvements to vessels of which the wall comprises two equidistant envelopes separated by a gap within which a fluid can flow, a grating in the gap between the two envelopes, the thickness of the grating equalling the width of the gap and said grating comprising an assembly of strips on edge and cooperating with one another to form a plurality of adjacent cells, each of said cells communicating with at least two of the adjacent cells and said grating further comprising at least two superimposed layers, each of which is formed of a plurality of identical, regularly undulating strips on edge and touching one another along the crests of the undulations, the layers being offset relative to one another so that the undulations meet, the

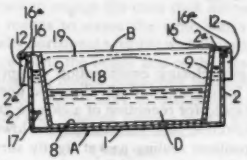


sum of the widths of the strips forming the superimposed layers being equal to the width of the gap.

3,946,893
DOUBLE PAN UTENSIL FOR BAKING CAKES WITH WATER INSULATION HELD BETWEEN THE SPACED APART SIDE WALLS OF THE TWO PANS

William R. Bowersmith, 33311 - 13th St., Union City, Calif. 94587

Filed Aug. 30, 1974, Ser. No. 502,152
Int. Cl.² A47J *24/10*; B65D *25/18, 25/28*
U.S. Cl. 220—13 **2 Claims**



1. A two pan cake baking utensil comprising:

a. an outer pan for holding water and having a bottom and side and end walls, said end walls having centrally disposed and outwardly extending keepers with transversely extending grooves in their undersurfaces;

b. an inner pan for holding cake batter and insertable into said outer pan so that the bottom of the inner pan will contact with the bottom of the outer pan, said inner pan having horizontal end flanges overlying said keepers when the inner pan is nested within said outer pan;

c. the portions of said horizontal end flanges that are disposed laterally of said keepers when the pans are nested having downwardly bent integral extensions so that there are a pair of spaced apart extensions at each end of said inner pan that straddle said keepers;

d. the inner end of each extension having an inwardly bent ear that extends at right angles to the plane of said end flanges so that each end of said inner pan will have a pair of spaced apart ears straddling their adjacent keeper of the outer pan, when the pans are nested;

e. a handle pivotally mounted between and supported by each pair of ears, the pivotal axis of each handle paralleling the axis of the groove in the underside of the adjacent keeper;

f. each keeper having an integral upturned catch adapted to enter the groove of the adjacent keeper when the pans are nested, each catch forcing its keeper against the undersurface of the end flange of said inner pan when said handle is swung into operative position and holding the

bottom of the inner pan in contact with the bottom of the outer pan;

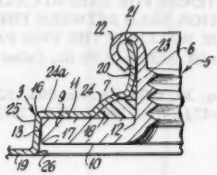
g. whereby said handles when in operative position will secure the inner pan to the outer pan and will maintain the bottoms of both pans in contact with each other and will also space the end walls of the inner pan from the adjacent end walls of the outer pan, the side walls of the inner pan having laterally extending flanges that overlie the side walls of the outer pan and the lateral flanges on the side walls of the inner pan having beaded edges engaging with the adjacent edges of the outer pan side walls for spacing the side walls of the inner pan from the side walls of the outer pan so that water in the outer pan will surround the side and end walls of the inner pan and act as insulation.

3,946,894

DRUM CLOSURE

Vyto Simkus, Chicago, Ill., assignor to American Flange & Manufacturing Co. Inc., New York, N.Y.

Filed Nov. 11, 1974, Ser. No. 522,637
Int. Cl.² B65D *41/04*
U.S. Cl. 220—256 **4 Claims**



1. A container closure combination comprising a metal closure flange having an internally threaded upstanding cylindrical neck adapted for reception of a closure plug, a laterally extending noncircular base surrounding the lowermost end of said neck, a resilient sealing gasket tightly surrounding said flange neck and seated on said flange base, said flange being nested within a metal container wall section having an upstanding collar closely surrounding said flange neck, a container wall embossment at the base of said collar having a laterally extending portion overlying said flange base, upwardly curved gasket confining means formed in said laterally extending embossment portion radially outwardly of said collar, said embossment having a polygonal wall depending from said laterally extending portion and extending downwardly adjacent said flange base to a point wherein the upper surface of the container wall section is displaced vertically below the lower surface of the said flange base and an outwardly curled bead at the uppermost end of said flange neck encasing the upper end of said collar.

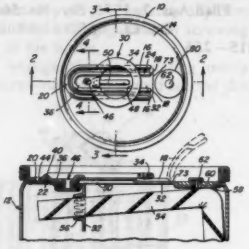
3,946,895

CONTAINER LID WITH TEAR-OUT CLOSURE AND STRAW

William A. Pugh, 5200 S. Harper Ave., Chicago, Ill. 60615

Filed May 30, 1974, Ser. No. 474,862
Int. Cl.² B65D *41/32*
U.S. Cl. 220—269 **12 Claims**

1. A container closure comprising a lid forming the end of a container, a pair of closely spaced generally parallel and concentric beads formed in the lid and projecting upwardly from the upper surface thereof, the beads being interconnected by a pair of connecting bead portions thus forming generally U-shaped outer and inner beads, a score line between said beads to define a line of separation, said beads and score line having terminal ends spaced from an edge of the lid and defining a tear-out strip, a pull ring assembly attached to the lid and overlying the inner bead and the connecting bead portion thereof with the pull ring assembly including a nose portion conforming with the connecting portion of the inner bead and overlying and contacting the score line between the



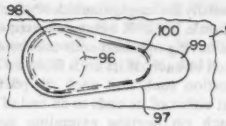
connecting bead portions to provide breakthrough between the beads for pulling the tear-out strip upwardly and leaving the end thereof remote from the connecting portions of the beads attached to the lid.

3,946,896

CONTAINER WITH TEAR-WELD OPENING MEANS

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation of Ser. No. 192,378, Oct. 26, 1971, Pat. No. 3,802,594, which is a continuation-in-part of Ser. No. 783,320, Dec. 12, 1968, Pat. No. 3,615,034, which is a continuation-in-part of Ser. No. 609,397, Jan. 16, 1967, Pat. No. 3,426,959, which is a continuation-in-part of Ser. No. 362,868, April 27, 1964, Pat. No. 3,311,288. This application Dec. 3, 1973, Ser. No. 421,114
Int. Cl.² B65D *39/12*
U.S. Cl. 220—273 **6 Claims**



1. A container assembly comprising:

a container defining a housing with a thin wall enclosing and containing fluent contents to be selectively dispensed therefrom,

an opening formed in a portion of said container wall, and

a closure disposed across and extending beyond said opening,

said closure comprising an elongated flat strip of relatively thin flexible sheet material,

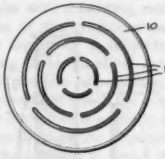
a first portion of said elongated flat strip sheet material being welded against and sealed to the outside surface of said container along a weld line formed between said flat strip and said container wall which weld line completely surrounds said opening in said container wall,

a second portion of said flat strip of thin sheet material defining said closure and comprising one end thereof, said second portion of flat strip material being unattached to said container wall and being of sufficient length to permit it to be grasped betweed the thumb and forefinger of the hand and to be pulled thereby outwardly from said container wall to permit the welding defined by the circumscribing weld line between said first portion and the outside surface of said container wall to be destroyed whereby the entire strip closure may be removed from said container wall and the opening in said container wall may be uncovered to permit the contents of said container to be dispensed through said opening.

3,946,897
DRUM COVER MADE FROM THERMOPLASTIC RUBBER

Anthony P. Wolff, Cheshire, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Filed Mar. 25, 1974, Ser. No. 454,355
Int. Cl.² C08L 23/16
U.S. Cl. 220—306 4 Claims

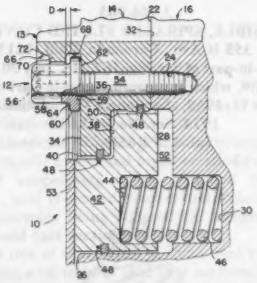


1. A removable, elastic, protective drum cover comprising a disc made of a thermoplastic elastomer which is a blend of from 50 to 10% by weight of a poly-alpha-olefin plastic and correspondingly from 50 to 90% by weight of a rubbery copolymer of ethylene and propylene with or without a copolymerizable non-conjugated diene, said disc having a peripheral lip adapted to stretch over and frictionally engage the end of a drum and then retract snugly to form an effective protective seal therewith while remaining removable from the drum, thereby protecting the complete head of the drum from dirt and adverse atmospheric influences, the said cover providing non-slip characteristics, and being capable of withstanding pressures up to 6000 pounds while retaining the ability to protect the head of the drum, the said cover being durable and movable from one drum to another to provide at least 30 reuses of the cover.

3,946,898
STRAIN-LIMITING FASTENING APPARATUS

Peter F. M. Prillinger, Peoria Heights, and Paul C. Rosenberger, Decatur, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 11, 1974, Ser. No. 522,389
Int. Cl.² B65D 45/16
U.S. Cl. 220—325 12 Claims



1. A strain-limiting fastening apparatus, for containing a source of potential energy entrapped between a pair of axially separable members, comprising;

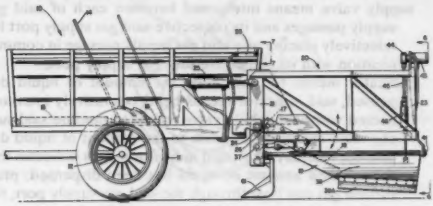
a plurality of fasteners securable to one of such separable members for substantially axially holding the other member thereto in opposition to the source of potential energy; and

means on said other member and cooperating with each of said fasteners for limiting the maximum axial adjustment of an individual fastener relative to said other member to a predetermined incremental amount which is less than the axial adjustment of said fastener relative to said one member necessary for full assembly or disassembly of said members.

3,946,899
SUGAR CANE PLANTER

Charles V. Allain, 902 2nd St., Franklin, La. 70538

Filed Feb. 7, 1975, Ser. No. 547,974
Int. Cl.² A01C 11/00
U.S. Cl. 221—225 8 Claims



1. For use with a cane cart having a pusher plate for moving cane standing on its butt end from the front toward the rear of the cane cart, a cane planter comprising:

a. a metering means comprising a rotary shaft across the transverse width of the cane cart and having paddles extending radially off said shaft and spaced circumferentially about said shaft and being of a radial length sufficient to engage the butt end of the stalks and move them rearwardly of the cart so that the stalks will fall onto said cane orienting means,

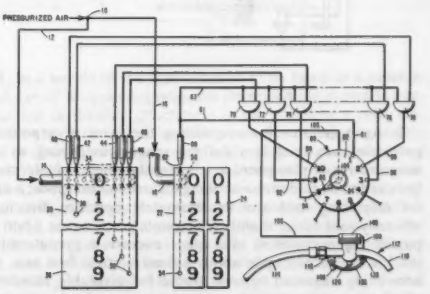
b. cane orienting means positioned rearwardly of said metering means to engage the cane stalk delivered from said metering means to cause the cane stalks to assume a substantially horizontal attitude with the major axis of the stalks lying along the major axis of the cane cart, and

c. cane dispensing means positioned beneath the horizontally oriented cane stalks to dispense the cane stalks horizontally into planting furrows in the ground.

3,946,900
AUTOMATIC LIQUID DISPENSING SYSTEM

Ralph DuBrueler, Jr., 801 N. Pitt St., Apt. 1508, Alexandria, Va. 22314

Filed Oct. 23, 1973, Ser. No. 408,502
Int. Cl.² G01F 1/08
U.S. Cl. 222—20 9 Claims



1. A liquid dispensing system comprising:

liquid cut-off valve means for a liquid dispensing line movable by gas pressure from a dispensing position to a cut-off position,

selector valve means for entering into the system the desired amount of liquid to be dispensed, said selector valve means comprising a valve body having a plurality of valve

inlet ports, a valve outlet port, and a valve element for connecting together a selected one of said valve inlet ports with said valve outlet port, each of said valve inlet ports representing a specific amount of liquid to be dispensed,

a plurality of gas supply ports for communicating with a source of pressurized gas, each said gas supply port representing an amount of liquid dispensed,

a plurality of gas supply passages connectable at one end to respective ones of said valve inlet ports and terminating at their other ends adjacent to said gas supply ports,

supply valve means interposed between each of said gas supply passages and its respective said gas supply port for selectively placing one said gas supply passage in communication with its respective said gas supply port,

indicator means for indicating the amount of liquid dispensed, said indicator means being operatively interconnected with said supply valve means to operate said supply valve means in response to the amount of liquid dispensed, whereby when said indicator means indicates that the selected amount of liquid has been dispensed, pressurized gas can flow through the said gas supply port, the said gas supply passage, and the said valve inlet port representing the selected amount, and thereafter through said valve outlet port to operate said liquid cut-off valve.

3,946,901

APPARATUS FOR CONTROLLING THE LEVEL OF A PARTICULATE POURABLE MATERIAL IN A DEFINED SPACE

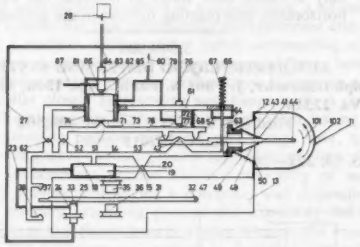
Hans Oetiker, St. Gallen, Switzerland, assignor to Gebruder Buhler AG, Uzwil, Switzerland

Filed Mar. 28, 1974, Ser. No. 455,904

Claims priority, application Switzerland, Apr. 4, 1973, 4848/73

Int. Cl.[2] B67D *5/08*; **H01H** *35/00*

U.S. Cl. 222—56 **17 Claims**



1. An apparatus for controlling the level of a pourable particulate material in a defined space, comprising an arm mounted for displacement in a horizontal plane; a feeler member carried by said arm and being located in said space; a drive for displacing said arm in alternately opposite directions, whereby said feeler member encounters resistance when the particulate material in said space exceeds a predetermined level; a frame pivotable about a fixed vertical first axis, said arm being mounted on said frame for pivotable movement about a second vertical axis; first means operatively associated with said arm for sensing resistance encountered by said feeler member and converting the sensed resistance into a control signal, said first means being mounted on said frame and being engaged by said arm for converting said resistance which is transmitted in form of a torque transmitted from said arm to said first means; and second means for furnishing said control signal to a device which is to be controlled thereby.

3,946,902

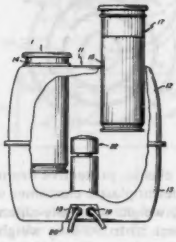
AUTOMATIC FEEDER FOR INFUSION OF A SOLUBLE SOLID SOLUTE INTO A CIRCULATING SOLVENT

Frank N. Stepanek, Jr., Syracuse, N.Y., assignor to Aspen Industries, Inc., Tully, N.Y.

Continuation of Ser. No. 868,374, Oct. 22, 1969, abandoned. This application Sept. 12, 1972, Ser. No. 288,253

Int. Cl. B67d *5/08*

U.S. Cl. 222—64 **26 Claims**



1. An automatic feeder comprising

a. a housing,

b. solvent inlet and outlet means in the housing,

c. valve means operatively connected to at least the said inlet means responsive to the level of solvent in the housing, said valve means maintaining a substantially constant solvent level in the housing under normal operating conditions,

d. a hollow, solid solute supply canister detachably suspended from the top of the housing and depending therefrom, the canister having an open bottom submersible in the solvent in the housing under normal operating conditions,

e. a plurality of solid solute tablets vertically stacked in the canister, and

f. internal constriction means in the canister in proximity to the open bottom thereof, the said constriction means being shaped and dimensioned to engage and retain the lowermost tablet within the canister until the said lowermost tablet has dissolved sufficiently to pass through said constriction means.

3,946,903

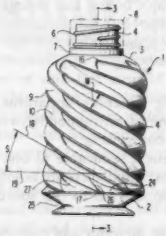
COLLAPSIBLE, SPIRALLY FLUTED CONTAINER

Carol Parker, 355 H Ave., Coronado, Calif. 92118

Continuation-in-part of Ser. No. 167,715, July 30, 1971, Pat. No. 3,819,789, which is a continuation-in-part of Ser. No. 832,257, June 11, 1969, abandoned. This application June 25, 1974, Ser. No. 483,011

Int. Cl.[2] B65D *35/08*

U.S. Cl. 222—92 **4 Claims**



1. An integral container for dispensing viscous material, said container being made of yieldable material and compris-

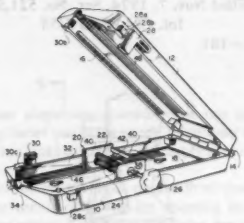
ing a top shoulder portion having a dispensing opening, a base portion and a body portion extending between said shoulder and said base portion, a plurality of contiguous external channels and contiguous internal channels in the wall of the body portion, each channel extending spirally and continuously from the shoulder portion to the base portion, each of said channels having a spiral slope angle in the range of 25° through 35°, said spirally extending channels causing said container to collapse with a twisting motion to mechanically thrust the contents of the container out of the dispensing opening when the container is subjected to a compressing force directed along its longitudinal axis, said container assuming a distended position when empty of contents and the resilience of the material of which the container is made being such that when the container is partially collapsed to dispense some of its contents through the dispensing opening the container remains in the position to which it was collapsed even though the dispensing opening is unobstructed, thus preventing air from being sucked into the container.

3,946,904

ENCAPSULATED TUBE DISPENSING UNIT

Maleshrao Mulakala, 47 Marlbank Road, Agincourt, Ontario, Canada

Filed Aug. 19, 1974, Ser. No. 498,604
Int. Cl.² B65D *35/28*
U.S. Cl. 222—102 **2 Claims**



1. A dispenser for paste or viscous liquids in tubes, comprising in combination:

a pair of identically formed generally rectangular case sections hingedly connected together at one end;

a pair of cooperating rollers mounted in a U-shaped bracket, said U-shaped bracket and rollers comprising a roller assembly being adapted for transverse reception within said case sections;

means, on one of said rollers to rotate said roller assembly, projecting exteriorly of said case sections;

a longitudinal rack mounted at one side of each of said case sections;

a longitudinal track provided in each of said case sections near the longitudinal edges thereof;

said roller assembly including a pair of gears, one gear on each side thereof, adapted for engagement in said longitudinal racks, one of said gears being directly connected to said means to rotate said roller assembly;

locking means to maintain said case sections in closed position; and

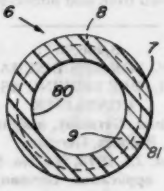
said pair of rollers each having a set of teeth projecting therefrom, centrally thereon, said teeth closely intermeshing when said rollers are rotated in said bracket.

3,946,905

COLLAPSIBLE PLASTIC TUBES

Joseph A. Cogliano, Baltimore, Md., assignor to W. R. Grace & Co., New York, N.Y.

Division of Ser. No. 453,314, March 21, 1974. This application July 24, 1975, Ser. No. 599,247
Int. Cl.² B65D *35/08*
U.S. Cl. 222—107 **4 Claims**



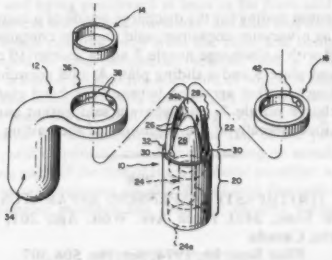
1. A collapsible packaging and dispensing tube having a cappable dispensing end and a heat sealable filling end, said collapsible packaging and dispensing tube comprising a cappable dispensing means heat sealed to a collapsible plastic tube comprising a single ply, heat flowable, oriented plastic tube having an unshrunk inner portion and a shrunk outer portion.

3,946,906

NOZZLE FOR PRESSURIZED CANS OF WHIPPED TOPPING

William Schwede, 40 Woodmar Terrace, West Seneca, N.Y. 14224

Filed July 7, 1975, Ser. No. 593,539
Int. Cl.² B67D *35/22*
U.S. Cl. 222—135 **11 Claims**



1. In a nozzle of the type adapted to be fitted to a pressurized can of whipped topping, the improvement in nozzle construction facilitating attachment to the nozzle of a color dispenser characterized as including a source of coloring matter and a distributor ring having a plurality of nozzles spaced about its inner circumference and arranged in flow communication with said source, said nozzle construction comprising:

an elongated body formed of plastic material and characterized as including a generally cylindrical base portion and an integrally formed generally frusto-conically shaped and resiliently deformable discharge portion, said body having an axially extending through passageway provided with an inlet end defined by said base portion for fitting said nozzle construction to said can and with a discharge orifice defined by said discharge portion, and a plurality of apertures arranged within said discharge portion adjacent the juncture thereof with said base portion, said apertures extending radially through said discharge portion and opening in flow communication with said passageway, and said apertures being arranged and dimensioned to snap-fit receive said nozzles of said ring as said

ring is moved axially over said discharge portion towards said base portion, whereby to removably retain said color distributor in operative association with said nozzle construction with the periphery of said nozzles of said ring fluid sealed relative to portions of said discharge portion bounding said apertures to prevent escape of topping outwardly through said apertures; and

sealing means detachably secured about said nozzle construction for closing said apertures when said color dispenser is removed from said nozzle construction.

3,946,907

VACUUM SEALING FOR THE DISCHARGE NOZZLE OF A CASTING LADLE SERVING AS A VACUUM CONTAINER

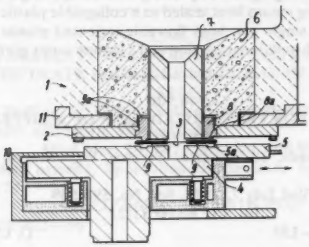
Jürgen Berve, Bochum, Germany, assignor to Fried. Krupp Huttenwerke AG, Bochum, Germany

Filed Oct. 23, 1974, Ser. No. 517,261

Claims priority, application Germany, Nov. 2, 1973, 7339191[U]

Int. Cl.² B22D *37/00, 41/08*

U.S. Cl. 222—152 **4 Claims**



1. Vacuum sealing for the discharge nozzle of a casting ladle serving as a vacuum container, said vacuum container being provided with a discharge nozzle **7** and a shutter **10** comprising a head plate **5** and a sliding plate **4**; said vacuum sealing comprising a gasket arranged between the head plate **5** and the discharge nozzle **7**; and wherein said gasket can be destroyed mechanically at the beginning of the casting.

3,946,908

TOOTHPASTE DISPENSING APPARATUS

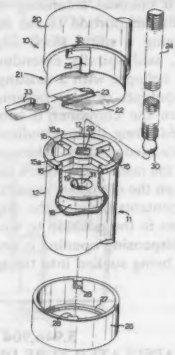
Jong Un Yoon, 2431 Finch Ave. West, Apt. 201, Weston, Ontario, Canada

Filed Sept. 16, 1974, Ser. No. 506,307

Int. Cl.² B65D *83/00*

U.S. Cl. 222—162 **12 Claims**

1. An apparatus for dispensing toothpaste and the like comprising in combination a tube having an outlet at one end thereof, a disc of a peripheral configuration corresponding to the cross-sectional configuration of said tube disposed co-axially in said tube, a base located at the end of said tube opposite said outlet, and a tube holder having a tubular body portion and a cylindrical base portion, the bottom of said cylindrical base portion having a threaded aperture co-axial with the longitudinal axis of said cylindrical base portion, a threaded shaft threadably engaging said threaded aperture, said base of said tube having an opening which is adapted to permit free passage of said shaft through said opening so that the shaft engages said disc, the configuration of said threaded shaft and said opening being such that the opening surrounds said shaft in a manner to preclude relative rotational movement between said threaded shaft and the base of said tube when said tube is rotated, means for releasably connecting the tube to said base portion such that the tube is permitted to rotate relative to said cylindrical base portion when connected to said cylindrical bas portion, said threaded shaft engaging said disc through the opening provided in said tube base when the apparatus is assembled, rotation of said tube causing said



threaded shaft to advance into said tube thereby advancing said disc to dispense the contents of said tube.

3,946,909

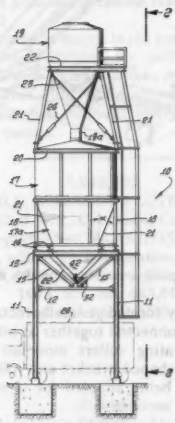
BIN CLOSURE SUPPORTED CLOSING MECHANISM

Robert R. Wheeler, 7615 Shady Oak Drive, Downey, Calif. 90240

Filed Nov. 7, 1974, Ser. No. 521,554

Int. Cl.² B67D *5/58*

U.S. Cl. 222—181 **7 Claims**



1. In apparatus for storing material such as wood chips, sawdust, shavings, and the like, comprising

a. a bin,

b. closure means closing the lower interior of the bin, and carried to swing downwardly to downwardly open the bin for dumping of said material from the bin interior, and

c. hoist mechanism including a flexible line element and a line spooling element, one of said elements connected with the closure means to spool the line element during swinging of said closure means,

d. said closure means including two closures carried by the bin to swing downwardly relatively away from one another and upwardly relatively toward one another so that the lower portions of the closures swing into and out of

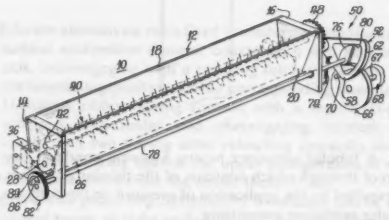
engagement to close and open the bin, the line element connected with one swingable closure adjacent the lower end thereof and the spool element mounted on the other swingable closure to be located adjacent the lower end thereof whereby the line is unwound off the spool only a relatively short distance as the closures swing downwardly to open the bin.

3,946,910

DRY TONER DISPENSER ASSEMBLY FOR COPYING MACHINE

Brian J. Case, Fountain Valley, Calif., assignor to A. B. Dick Company, Chicago, Ill.

Filed Jan. 13, 1975, Ser. No. 540,350
Int. Cl.² B65G *65/48*
U.S. Cl. 222—238 **11 Claims**



1. A dry toner dispenser assembly for use in dispensing quantities of dry toner particles to the developer apparatus of a copying machine, said dispenser assembly including in combination:

hopper means for receiving a quantity of toner particles, said hopper means defining an opening in the bottom thereof from which said toner particles are dispensed,

a dispenser roll being mounted for rotation in the bottom opening of said hopper means for carrying toner particles deposited on the surface thereof through said opening, into the developer apparatus,

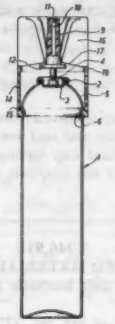
dispenser roll drive means, said drive means including a drive member coupled to said roll for rotating said roll in accordance with movement of said drive member in a first direction, means for moving said drive member in said first direction and means for selectively regulating the movement of said drive member in said first direction whereby said roll is rotatably driven incrementally in accordance with the movement of said drive member and further including one-way clutch means coupling said drive member and said dispenser roll, said clutch means translating the movement of said drive member in said first direction into rotation of said roll, said clutch means decoupling said drive member and dispenser roll upon said drive member being moved in the opposite direction, wherein said means for moving said drive member in said first direction includes rotatable wheel means having a member extending outwardly therefrom, said member engaging said drive member as said wheel means is rotated to move said drive member in said first direction and wherein said regulating means includes an adjustable stop means positioned for engagement with said drive member to limit the movement thereof, whereby the rotation of said dispenser roll is limited accordingly.

3,946,911

CAP FOR OPERATING DISPENSING VALVE WHICH MAY BE ACTUATED FROM A PLURALITY OF DIRECTIONS

Bruno P. Morane, Paris, France, and Giuseppe Sigaudo, Turin, Italy, assignors to L'Oreal, Paris, France

Continuation of Ser. No. 435,586, Jan. 22, 1974. This application May 28, 1975, Ser. No. 581,677
Claims priority, application France, Mar. 16, 1973, 73.09585
Int. Cl.² B65D *83/14*
U.S. Cl. 222—402.11 **17 Claims**



1. Dispensing cap adapted to be mounted on a pressurized container provided at its upper end with a dispensing valve having an outlet duct, said cap comprising a peripheral member carrying mounting means at one end for attaching the cap to the pressurized container and at least three fins arranged in a circle at its other end, with each of said fins individually movable in a plane passing substantially through the axis of the cap and the radially outer edges of said fins defining a cylinder and being positioned at least as far from said axis as the cylindrical wall of said container, and said fins defining an internal space opening away from the valve and being elastically hinged to said peripheral member, and a dispensing member actuated by said fins, one end of which is adapted to fit onto said outlet duct and actuate said duct to actuate said valve, at least part of said dispensing member lying in said space within the circle defined by the fins of the peripheral member, said dispensing member comprising an annular zone contacting each of the fins of the peripheral member, whereby radially inward pressure on any one of said fins will actuate said dispensing member and duct and thereby actuate said valve.

3,946,912

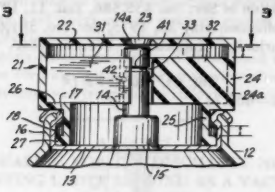
ACTUATOR CAP FOR AEROSOL DISPENSER

Emanuel Landsman, 245 N. Broadway, Yonkers, N.Y. 10706, and Irving Landsman, 3530 Henry Hudson Parkway, Riverdale, N.Y. 10463

Filed Jan. 2, 1975, Ser. No. 537,913
Int. Cl.² B65D *83/14*
U.S. Cl. 222—402.13 **13 Claims**

1. A cap for an aerosol bomb of the type comprising a container with an end wall having a longitudinally outstanding annular rim with an annular retaining flange at its free end and having a discharge nozzle extending axially from said end wall and a normally closed valve actuated by inward movement of said nozzle; said nozzle having actuator engagement means thereon at a point intermediate its length and spaced substantially from its outlet end, said cap having a side wall, means at one end of said side wall inter-engaging with said retaining flange for retention of said cap on said rim yet permitting limited relative longitudinal movement between said cap and said rim and nozzle a predetermined distance between a re-

tracted dispensing position and an extending nondispensing position, and inwardly movable actuator means carried by said cap to grip said actuator engagement means on said nozzle for axial inward movement of said nozzle and actuation of said



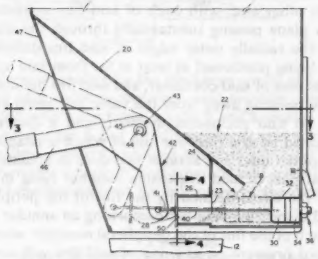
valve only when said cap is moved from said extended position to said retracted position and said inwardly movable actuator means are actuated, said cap having means to permit discharge therethrough of the contents of said container when the valve is actuated.

3,946,913

GRANULATED MATERIAL DISPENSER

Richard J. Merman, 200 Rochelle Ave., Philadelphia, Pa. 19128

Continuation-in-part of Ser. No. 372,810, June 22, 1973, abandoned. This application Feb. 19, 1974, Ser. No. 443,382
Int. Cl.² G01F 11/26
U.S. Cl. 222—453 2 Claims



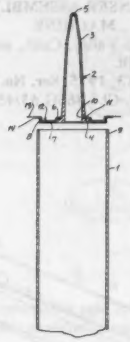
1. An apparatus for dispensing particulate matter, comprising: a container forming a chamber for retaining said matter, having an opening therein through which said matter may be fed by gravity to a first position proximate to a discharge opening in said container; an expansible plunger means for moving through said particulate matter and displacing a portion of said matter toward said discharge opening, comprising a plunger juxtaposed to said opening in said chamber so that at least a portion of the matter in said first position will be between said plunger and said discharge opening and an expansible sheath engaging said plunger, said sheath having a portion thereof retained against movement relative to said plunger; and actuating means for moving said plunger and expanding said sheath through said matter in the direction of travel of said plunger, thereby forming an expanded piston defined by the envelope of said sheath which is conformed to the surfaces of the plunger which extend in the direction of travel of the plunger through said matter, as said plunger moves through said matter to dispense a portion of said matter from said container by moving a portion of said matter from said first position toward said discharge opening.

3,946,914

ARRANGEMENT FOR SECURING A NOZZLE TO A CONTAINER

Ole Stig Ravn, Farum, Denmark, assignor to Stig Ravn A/S, Denmark

Filed Nov. 21, 1974, Ser. No. 525,987
Claims priority, application Denmark, Nov. 22, 1973, 6319/73
Int. Cl.² B65D 25/42
U.S. Cl. 222—574 4 Claims



1. A tubular container having a plastic nozzle at one end thereof through which contents of the tubular container may be expelled by the application of pressure on the contents, the tubular container comprising

a hollow cylindrical sleeve in which the contents of the tubular container are stored generally,

a nozzle for attachment to one end of the hollow cylindrical sleeve, the nozzle comprising

a hollow, centrally disposed, outwardly projecting, generally tapered spout through which the contents flow upon expulsion,

a flange attached circumferentially to the proximal end of the spout and extending radially outward so as to engage the hollow cylindrical sleeve at the one end thereof, the flange having a thick portion immediately adjacent to the spout and a thin radially extending portion outboard of the thick portion, and

a lip affixed to the thin radially extending portion of the flange and extending normally radially beyond the one end of the hollow cylindrical sleeve, the lip being thinner than the thin radially extending portion of the flange and being readily deformable, and

a generally disc-like plate for securing the nozzle to the hollow cylindrical sleeve, the plate having a centered hole therein through which at least a major portion of the spout extends, the plate at the edges of the hole engaging the nozzle, and the marginal portion of the disc-like plate being curled over and deforming the lip of the nozzle against the end of the hollow cylindrical sleeve so as to effect a seal therebetween and to secure the nozzle to the end of the hollow cylindrical sleeve.

3,946,915

GARMENT HANGER WITH CLAMP GUARD

Walton B. Crane, Sherman Oaks, Calif., assignor to A & E Plastik Pak Co., Inc., City of Industry, Calif.

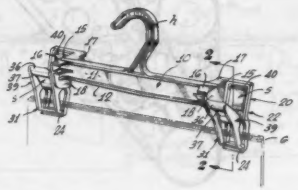
Filed Dec. 5, 1974, Ser. No. 529,616
Int. Cl.² A47J 51/14
U.S. Cl. 223—96 2 Claims

1. In a garment hanger, the combination of:

a horizontal hanger beam with a hook connected thereto midway of its length;

a relatively fixed clamp jaw integral with and depending from each end of said hanger beam, the lower extremities of said jaws having garment grippers thereon, and said jaws and grippers facing generally perpendicularly and in the same direction from a vertical plane defined by the beam, said jaws having upper end portions comprising handle members;

a clamp jaw pivotal on a horizontal axis parallel to the beam, and including a garment gripper at its lower extremity, opposed to each of said depending fixed jaws, the upper end portions of said pivotal jaws comprising handle members;



a fulcrum element on each fixed jaw intermediate the longitudinal extremities thereof, coaxial with said horizontal axis, interengaging with a coacting fulcrum element in a corresponding position on the corresponding fixed jaw,

a U-shaped ribbon spring formed with a medial U-part wrapped once under said interengaging fulcrum elements, and two flaring arms extending upwardly therefrom and bearing against the upper end portions of said handle members from the inside thereof; and

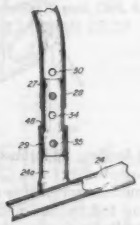
a guard wall projecting horizontally from each end of said hanger beam, at right angles thereto, just inwardly of the corresponding pivotal jaw, substantially at least as far as the location of the outermost limit of the handle portion of the pivotal jaw when in garment clamping position.

3,946,916

PACK FRAME LENGTH ADJUSTING COUPLING

John S. Lawrence, Ogden, Utah, assignor to Browning Arms Company, Morgan, Utah

Filed Feb. 14, 1974, Ser. No. 442,488
Int. Cl.² A45F *3/10*
U.S. Cl. 224—25 A **4 Claims**



1. A backframe structure comprising:

a back frame carrying shoulder straps and including a pair of side support members with bottom ends formed of tubular construction;

a hip belt frame carrying a hip belt and including a pair of upstanding tubular members corresponding to said side support members and of sufficiently large cross-section to receive said bottom ends of said side support members;

a pair of coupling members, each with an enlarged end mounted within a said upstanding tubular member and a shank portion of smaller cross-section extending up in slideable engagement within the interior of the bottom end of the corresponding said side support member, said enlarged ends being inserted sufficiently within said upstanding tubular members to provide an annular gap between the internal surface of said tubular members and the shanks of said coupling members, said gap to receive the bottom ends of said support members when said shanks are inserted to the maximum extent within said bottom ends;

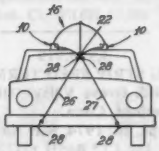
means for connecting said enlarged end portions to said tubular members; and means for connecting said shank portions to said side support members.

3,946,917

CAR-TOP BOAT CARRIER

Dennis M. Crawford, 19256 Partello Road, and Murray G. Crawford, 728 Wright Lane, both of Marshall, Mich. 49068

Filed May 4, 1973, Ser. No. 357,455
Int. Cl.² B60R *9/00*; **A47B** *91/00*
U.S. Cl. 224—42.1 R **9 Claims**



1. A car-top carrier for supporting and transporting a boat on the top of a car the improvement comprising: a pair of rigid plastic foam elongated carrier members each having a longitudinal arcuate channel provided therein adapted to receive a gunnel of said boat and to support said boat in an inverted position when mounted one on each side on said car top, a plurality of transverse channels in each of said members, said transverse channels communicating with said longitudinal arcuate channel and providing clearance for structures of said boat mounted to said gunnel, said longitudinal arcuate channel being so contoured as to cause distortion of said carrier members when mounted on the gunnel of said boat, thereby causing said carrier members to be clamped to said gunnel and means for fastening the ends of said boat to said car on which said boat and said carrier members are mounted.

3,946,918

HOSE FEEDER

William R. Babbin, and Stephen C. Sabo, both of Barberton, Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed June 23, 1975, Ser. No. 589,712
Int. Cl.² B65H *17/24*
U.S. Cl. 226—1 **9 Claims**

1. A method of continuously feeding hose in a direction parallel to the longitudinal axis of the hose into a pressurized hose treatment zone, which comprises:

a. pulling the hose into a pressurized feeding zone adjacent the treatment zone;

b. pushing the hose into the hose treatment zone from the feeding zone.

5. Apparatus for feeding elastomeric hose into a pressurized zone, the apparatus comprising:

a. a chamber having an inlet opening and an outlet opening;

b. means to pressurize the chamber;

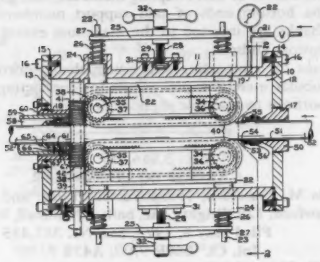
c. a plurality of endless, flexible belts within said chamber;

d. means to drive said belts;

e. an entrance sealing device at the inlet opening adapted to:

1. permit continuous passage of elastomeric hose from said chamber while simultaneously;

2. preventing escape of pressurizing fluid from said chamber and simultaneously;



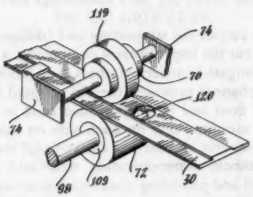
3. preventing escape of pressurizing fluid from said pressurized zone.

3,946,919

BINDING STRIP FEED TERMINATOR

Richard J. Ernst, Elk Grove Village, Ill., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 26, 1974, Ser. No. 509,579
Int. Cl.² B65H *17/22*
U.S. Cl. 226—11 **2 Claims**



1. Apparatus for providing metered lengths of adhesive bearing strips, from a supply roll of adhesive bearing strip, to a mechanism for fixing each of the metered lengths to a different one of a plurality of stacks of sheets, comprising:

a. a first roller rotatably coupled to the mechanism;

b. a second roller rotatably coupled to the mechanism, said first and second rollers being located to provide a nip for engaging the adhesive bearing strip, the axial length of the nip being smaller than the width of the adhesive bearing strip;

c. drive means for rotating one of the rollers, whereby adhesive bearing strip engaged by the nip is fed to the mechanism; and,

d. a hole, larger than the nip, aligned on the adhesive bearing strip for preventing advancement of the strip by the rollers when a predetermined length of adhesive bearing strip remains in said supply roll.

3,946,920

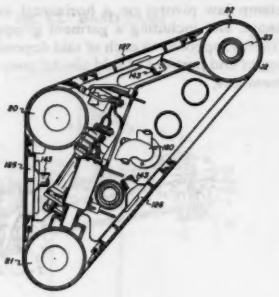
VACUUM SYSTEM CONTROL

William E. Jordan, Penfield; Edward L. Steiner, Macedon, and Kenton W. Fiske, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 22, 1974, Ser. No. 444,921
Int. Cl.² B65H *23/18*
U.S. Cl. 226—39 **8 Claims**

1. In an apparatus utilizing web material arranged to be moved in a path having at least one run adjacent a vacuum holding device which, when in vacuum condition, is adapted to hold said web run thereagainst, and a drive mechanism for driving said web material in its path of movement, the improvement including,

a control system coupled to said holding device and said drive mechanism, said control system including means for



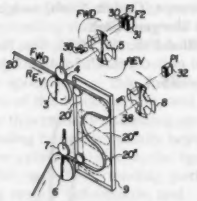
measuring pressure within said holding device, said control system activating said drive mechanism when said pressure within said vacuum holding device is at a predetermined value.

3,946,921

APPARATUS FOR FEEDING PACKAGING STRAP

Atushi Noguchi, Chiba, Japan

Filed Mar. 25, 1974, Ser. No. 454,554
Claims priority, application Japan, Feb. 18, 1974, 49-18524
Int. Cl.² B65H *25/32*
U.S. Cl. 226—43 **5 Claims**



1. An automatic feeding apparatus for feeding packaging strap or the like, comprising:

a strap feeding mechanism having means for detecting an amount of strap fed by the mechanism, and reversibly rotatable feed rolls for feeding the strap;

a strap prefeeding mechanism for prefeeding strap to said strap feeding mechanism and having means for detecting an amount of strap prefed, and unidirectionally rotatable prefeed rolls for prefeeding said strap;

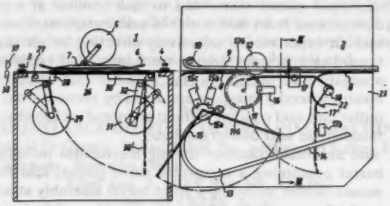
and a control mechanism having means for determining the amount (L) of strap fed when said feed rolls are rotated in a normal direction, means for determining the amount (R) of strap returned when said feed rolls are reversely rotated, means for determining the amount of strap prefed when said prefeed rolls are rotated, and means for stopping the strap prefeed rolls when the amount of strap prefed becomes equal to the difference between the amount (R) of strap returned and the amount (L) of strap fed.

3,946,922

PHOTOGRAPHIC COPYING MACHINE

Christian Gotze; Adolf Fleck; Karl Dreher, and Günther Heidrich, all of Munich, Germany, assignors to AGFA-Gevaert AG, Leverkusen, Germany

Filed Sept. 12, 1973, Ser. No. 396,457
Claims priority, application Germany, Sept. 13, 1972, 2244960
Int. Cl.[2] B65H 23/04
U.S. Cl. 226—91 15 Claims



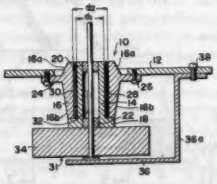
1. In an apparatus wherein an elongated web of paper or the like is fed lengthwise, particularly in a photographic copying machine, a combination comprising transporting means for advancing a web lengthwise along a predetermined path between a plurality of successive stations; and elongated guide means defining said path and forming a surface along which said web moves lengthwise, said guide means including stationary guide members spaced in longitudinal direction of said path and providing at least one opening which affords access to said path, and at least one second elongated guide member movable between an operative position in which it forms part of said surface while substantially bridging said opening and an inoperative position in which it exposes said opening, and means for moving said second guide member between said positions thereof in such a manner that said second guide member assumes said operative position only during threading of the leader of a fresh web along said path.

3,946,923

METHOD FOR MANUFACTURING A CAPSTAN DEVICE OF A TAPE MACHINE

Niro Nakamichi, Kodaira, Japan, assignor to Nakamichi Research Inc., Kodaira, Japan

Filed Oct. 2, 1974, Ser. No. 511,432
Claims priority, application Japan, Oct. 4, 1973, 48-111781
Int. Cl.[2] B65H 17/20
U.S. Cl. 226—168 12 Claims



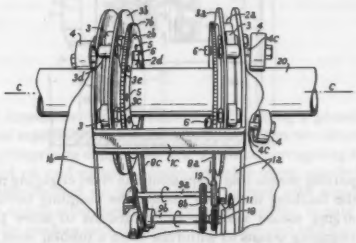
1. A method for manufacturing a capstan device of a tape machine comprising a double walled sleeve including an inner sleeve portion and an outer sleeve portion, said outer sleeve portion having supporting means provided on the periphery of said outer sleeve portion and at the top face mounted on a chassis of said tape machine, upper and lower bearings fitted into said inner sleeve portion at the opposite ends thereof and a capstan including a capstan shaft rotatably extending through said inner sleeve portion and journalled on said bearings, said method comprising the steps of preparing said inner sleeve portion with said upper and lower bearings fitted thereinto; preparing said outer sleeve portion having the inside diameter larger than the outside diameter of said inner sleeve portion and said supporting means provided on the periphery of said outer sleeve portion; inserting said inner sleeve portion into said outer sleeve portion in a generally coaxial relation to each other so as to form an annular space between said inner and outer sleeve portions; arranging said inner sleeve portion with said outer sleeve portion so that the axes of said bearings are substantially normal to the top face of said supporting means on said outer sleeve portion by adjusting said inner sleeve portion relative to the outer sleeve portion through said annular space; securing said inner sleeve portion to said outer sleeve portion; and finally extending said capstan shaft through said bearings in a journalled relation thereon.

3,946,924

TUBE HAUL-OFF MACHINE

Arnold Aalo, Porsgrunn, Norway, assignor to Granges Essem Plast A/S, Porsgrunn, Norway

Filed Nov. 1, 1974, Ser. No. 520,213
Claims priority, application Norway, Nov. 5, 1973, 4245/73
Int. Cl.[2] F16H 13/08
U.S. Cl. 226—176 4 Claims



1. A tube haul-off machine comprising at least one pair of parallel spaced annular supporting wheels supported for rotation in opposite directions about a common axis, each supporting wheel carrying rotatable haul-off wheels which are arranged at a radial distance from the axis corresponding to the outer radius of the tube, and the axes of which are inclined relatively to the common axis, the haul-off wheels of one supporting wheel being inclined in the opposite direction of the haul-off wheels of the other supporting wheel so that upon rotation of the supporting wheels in engagement with the surface of the tube the haul-off wheels will travel along helices about said axis on the peripheral surface of the tube thereby to pull the tube along the axis.

3,946,925

RIVETTING MACHINES

Clifford Edmund Brewer, "Lucky Stars", Lagoon Road, Lilliput, Parkstone, Dorset, England

Filed Nov. 26, 1974, Ser. No. 527,344
Claims priority, application United Kingdom, Nov. 26, 1973, 54822/73
Int. Cl.[2] B21J 15/10
U.S. Cl. 227—60 24 Claims

1. A riveting apparatus for tubular rivets, the apparatus comprising a rivet receiving and supporting structure at a first station of the apparatus, rivet deforming means at a second station of the apparatus for applying a force to deform a rivet, means for picking-up rivets from said structure, and conveying means for conveying the rivet pick-up means from the first station to the second station and back, the rivet pick-up means comprising:

means for engaging within a tubular rivet;

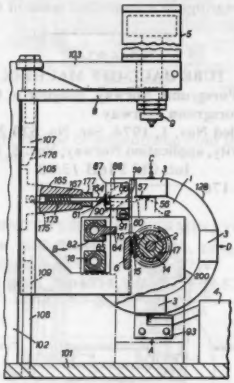
means for supporting the rivet engaging means, the supporting means being displaceably mounted for moving the

rivet engaging means from an inoperative position to an engagement position in which it engages within a rivet at the first station;

means for urging the supporting means in a direction to produce said movement of the rivet engaging means to the engagement position; and

latching means for releasably coupling the urging means to the supporting means, the latching means being releasable by the application of force to the latching means;

the apparatus further comprising force coupling means for coupling the supporting means when at the second station to the deforming means to transmit a force via the sup-



porting means and by-passing the rivet engaging means to the latching means to release the coupling between the urging means and supporting means to allow the rivet engaging means to withdraw from a tubular rivet into the inoperative position, and displacing and holding means for displacing the urging means in a direction to recouple the coupling between the urging means and the supporting means as the rivet engaging means is conveyed from the second station back to the first station, and for holding the urging means and supporting means so that the rivet engaging means is held in the inoperative position until it is conveyed back to the first station.

3,946,926

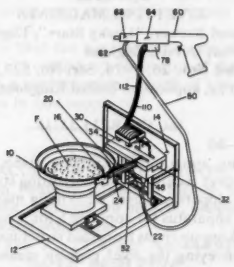
AUTOMATIC FASTENER EMPLACEMENT MECHANISM

Clyde P. Willis, P.O. Box 335, Conover, N.C. 28613

Filed Aug. 26, 1974, Ser. No. 500,644

Int. Cl.² B25C *1/04*

U.S. Cl. 227—112 **2 Claims**



1. A pneumatic fastener driving mechanism and continuous fastener supply mechanism therefore comprising in combination:

a. supply hopper and delivery means for continuously removing fasteners from said supply hopper;

b. escapement means having an inlet adjacent said delivery means and an outlet, said escapement means including a pickoff means for receiving fasteners at said inlet and delivering them one at a time to said outlet;

c. a fastener conduit connected at one end to said outlet and at the other end to said fastener driving mechanism, said conduit selectively receiving fasteners headfirst from said escapement means for delivery to said fastener driving mechanism;

d. air input means connected to said conduit at a point downstream from said outlet of said escapement means, said air input means selectively directing an air stream toward said fastener driving mechanism and establishing a negative air pressure at the outlet of said escapement means, whereby fasteners are urged by vacuum from said outlet into said conduit without an attendant blowback of fasteners in said delivery means;

e. said automatic fastener driving mechanism including a barrel containing a reciprocal drive piston, said barrel means further including a front barrel assembly attached to the front end of said barrel assembly and including a longitudinally extending receiving chamber;

f. said front barrel assembly further including a fastener inlet through the wall thereof, said inlet commencing at a point near the front of said barrel assembly and being slanted inwardly toward the rear of said receiving chamber;

g. means for connecting said inlet with said conduit;

h. at least one air vent extending through said barrel assembly at a point between said fastener inlet and a rear end of said receiving chamber;

i. whereby fasteners are fed by air pressure head first through said opening and into contact with the front end of said piston when in its withdrawn position, said air pressure escaping through said vent and holding said fastener in proper engagement with said drive piston within said receiving chamber.

3,946,927

MAGAZINE FOR FASTENER-DRIVING APPARATUS

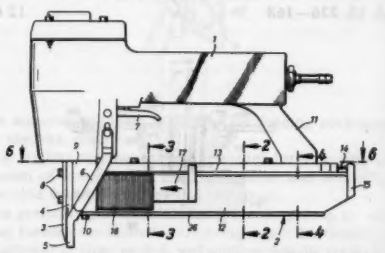
Hellmuth Fehrs, Hamburg, Germany, assignor to Joh. Friedrich Behrens, Ahrensburg, Germany

Filed June 20, 1974, Ser. No. 481,170

Claims priority, application Germany, June 27, 1973, 2332533

Int. Cl.² B25C *5/06*

U.S. Cl. 227—126 **10 Claims**



1. A magazine for apparatus for driving fastener elements comprising, in combination, a lower bracket adapted to be fastened to fastener driving apparatus, said bracket having a fastener ejection channel end and a rear end, and elongated guide mounted upon said bracket extending thereabove and including a free upper edge over which an elongated strip of fastener elements may be supportably placed and longitudinally displaced toward said bracket ejection channel end, a cover support member mounted upon said bracket and ex-

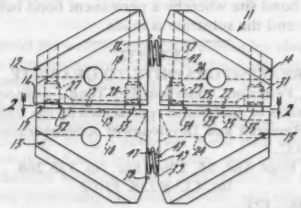
tending thereabove disposed adjacent and parallel to said guide and having a cover guiding upper surface, a fastener cover slidably displaceably mounted upon said cover upper surface for lateral movement with respect to said guide between a release position wherein said cover fully exposes the upper free edge of said guide to permit a strip of fasteners to be placed upon said guide by a relative lateral movement between said guide and the strip of fasteners and an operative position wherein said cover is superimposed over said guide in spaced relation to said guide upper edge confining the fastener elements upon said guide, and a resiliently biased fastener element pusher slide slidably mounted adjacent said guide engaging fastener elements supported thereon and biasing the elements toward said bracket ejection channel end.

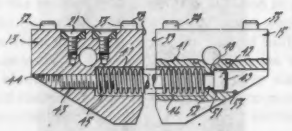
3,946,928

ADJUSTABLE DIE FOR COLDWELDING MACHINE

Leonard Di Grasso, Philadelphia, Pa., assignor to Kelsey-Hayes Company, Romulus, Mich.

Filed Jan. 2, 1973, Ser. No. 320,097
Int. Cl.² B23K 21/00
U.S. Cl. 228—3.1 1 Claim





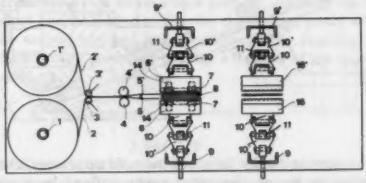
1. A die set for a coldwelding machine or the like comprising a first die, a second die, said dies having facing surfaces and adapted to be used in a machine having means for moving said facing surfaces relative to each other, said first die having a threaded opening extending perpendicularly to its facing surface and terminating in a counterbore extending through said facing surfaces, said second die having a bore aligned with the counterbore of said first die, a smaller diameter bore formed at the termination of said first mentioned bore and a third bore formed at the termination of said second bore and extending through an opposite face of said second die, said second and said third bores of said second die defining a shoulder facing opposite to the facing surface of said second die, and adjustable stop means interconnected to said dies for permitting said dies to move relative to each other freely in a first direction and for adjustably limiting the degree of relative movement of said dies in the opposite direction, said adjustable stop means comprising a screw extending through the bores of said second die, the counterbore of said first die and having a threaded portion received in the threaded opening of said first die, said screw having a headed portion received in said third bore of said second die and engaging said shoulder, and a coil spring means contained within said counterbore and said first bore of said second die and urging said facing surfaces of said dies away from each other and said shoulder of said second die into engagement with said head of said screw.

3,946,929

CONTAINER MAKING MACHINE

Massimo Armetti, Viale Volturno 33, Cervia (Ravenna), Italy

Filed May 1, 1974, Ser. No. 466,034
Claims priority, application Italy, May 4, 1973, 23719/73
Int. Cl.² B65B 43/08; B21D 39/03; B65B 47/00
U.S. Cl. 228—15.1 7 Claims



1. A container making machine for forming a plurality of identical equidistantly spaced apart recesses in two aluminum strips, comprising support means; a pair of corrugating rollers mounted on said support means rotatable about parallel axes and being formed on the periphery thereof with closely arranged corrugating elements extending parallel to said axes; means for guiding said aluminum strips between said corrugating rollers whereby said strips are formed with closely adjacent corrugations extending transverse to the longitudinal direction of said strips; recess forming means downstream of said rollers and comprising a pair of platens mounted on said support means movable toward and away from each other with each platen having recesses in a face thereof parallel to and facing corresponding recesses in the face of the other platen with a plurality of recesses in each platen equidistantly spaced from each other and of a configuration according to the recesses to be formed in said strips, a single planar member stationarily mounted on said support means between said faces of said platens and having a plurality of enlarged portions respectively aligned with said recesses in said platens and having respectively outer surfaces substantially matching said recesses in said faces of said platens, and means for moving said platens between an inactive position in which said faces thereof are spaced considerably from said planar member and an active position in which said faces are closely adjacent to said planar member so that the two aluminum strips which pass on opposite sides of said planar member while said platens are in said inoperative positions are formed with said recesses when said platens are moved to said operative positions; welding means downstream of said recess forming means and comprising a pair of heated platens each having recesses in a face thereof parallel to and facing like recesses in the other heated platen with said recesses spaced from each other and of a configuration equal to the spacing and configuration of the recesses of the platens of said recess forming means, and means mounted on the support means and connected to said heated platens for moving the same between an inactive position and an active position in which said faces of said heated platens press the two strips passed therebetween against each other to weld said strips to each other; and means arranged to engage superimposed edges of said strips for transporting the same stepwise between said rollers, said platens of said recess forming means, and said heated platens of said welding means.

3,946,930

APPARATUS FOR JET SOLDERING CONTAINERS

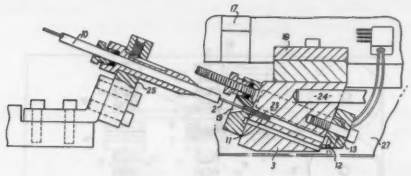
George Bell, Radlett; David G. Rance, Boreham Wood, and Sydney Raxworthy, Potters Bar, all of England, assignors to Metal Box Limited, Reading, England

Filed Sept. 30, 1974, Ser. No. 510,714

Claims priority, application United Kingdom, Oct. 9, 1973, 47151/73

Int. Cl.² B23K *1/16*

U.S. Cl. 228—41 4 Claims



1. An apparatus for jet soldering, said apparatus comprising a heater having an elongated cavity defined by a wall, said heater also having heating means for heating said cavity wall to a temperature to effect melting of solder, said cavity having an inlet and a discharge, said discharge being in the form of discharge orifice means for forming a jet of solder, feed means for feeding solder in the form of wire, said inlet including a bore generally matching the diameter of the intended solder wire, and said means for feeding solder forming means for effecting the discharge of a solder jet from said discharge orifice, said feed means being an intermittent feed means and including a reciprocating chuck, and said reciprocating chuck having cam actuated drive means.

3,946,931

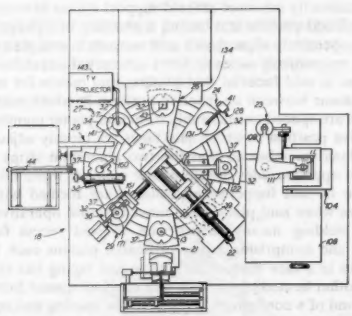
METHODS OF AND APPARATUS FOR BONDING AN ARTICLE TO A SUBSTRATE

Norman Bahnck, Bethlehem; Raymond H. Booth, Allentown; John A. Boyer, Allentown, and Jack J. Monahan, Allentown, all of Pa., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Nov. 27, 1974, Ser. No. 527,924

Int. Cl.² H05K *3/30*; H01L *21/58*

U.S. Cl. 228—102 18 Claims



1. In a method of bonding an article to a substrate, the steps comprising:

locating the substrate on a substrate holder mounted on a support member;

transferring the substrate holder from the support member to a manipulator;

manipulating the position of the substrate holder with respect to the support member to align the substrate to a reference axis; and

transferring the substrate holder from the manipulator to the support member to retain the position of the substrate aligned to the reference axis with respect to the support member.

4. A method of bonding an electronic device to a substrate, which comprises:

loading the substrate onto a substrate holder at a loading station;

moving the substrate holder along a predetermined path from the loading station to an alignment station, to a bonding station and then to an unloading station;

adjusting the position of the substrate holder with respect to the path when the substrate holder is located at the alignment station to move a bond site on the substrate into alignment with a bonding axis upon the substrate holder having moved to the bonding station;

preheating the substrate to a temperature approaching the temperature desired for bonding the device to the substrate;

aligning the device to the bond site of the substrate;

forcing the aligned device without additional heating to the bond site to tack-bond the device to the substrate; and then

bonding the tack-bonded device with a heated bonding tip to the bond site whereby a permanent bond between the device and the substrate is made.

3,946,932

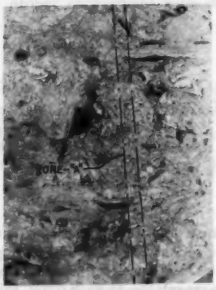
BRAZING GRAPHITE TO GRAPHITE

George R. Peterson, Andersonville, Tenn., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Apr. 25, 1968, Ser. No. 725,268

Int. Cl.² B23K *31/02*

U.S. Cl. 228—121 8 Claims



1. In the art of joining together structures of graphite by brazing which involves the method steps of placing selected surface portions of the graphite structures to be joined in a contiguous relationship, interposing a braze material between the contiguously disposed surface portions with the braze material contacting the surface portions, and thereafter heating the joint area of the resulting assembly to the desired brazing temperature; the improvement in the method which comprises using molybdenum powder as the braze material, applying a layer of the molybdenum powder to one or more of said surface portions, confining the joint area in an environment containing an inert atmosphere, pressing the surface portions together, heating the joint area to a temperature sufficient to melt the molybdenum and convert the latter to molybdenum carbide, subjecting the joint area to a temperature greater than about 2000°C. to effect diffusion of the molybdenum carbide into the graphite surface portions contiguous to the joint area, maintaining the joint area at the temperature greater than about 2000°C. for a duration sufficient to effect the diffusion of virtually the entire quantity of molybdenum carbide into the graphite while concurrently effecting the dissolution of excess graphite in the joint area,

and thereafter cooling the joint area for effecting the precipitation of dissolved graphite into the area of the joint occupied by the molybdenum carbide prior to the diffusion thereof and thereby providing a joint consisting virtually of graphite and having properties corresponding to those of the graphite structures.

3,946,933

PLANT FOR APPLYING AND WELDING REINFORCING ELEMENTS ONTO A METAL PLATE

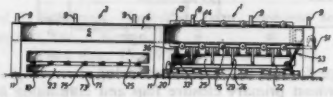
Charles Gunnar Birger Bergling, Kungalv, Sweden, assignor to ESAB-Hebe AB, Hallsberg, Sweden

Filed Mar. 11, 1974, Ser. No. 450,191

Claims priority, application Sweden, Mar. 14, 1973, 7303588

Int. Cl.[2] B23K *37/02*, *37/04*

U.S. Cl. 228—212 16 Claims



1. A method for welding elongate reinforcing elements to a metal plate comprising the steps of holding said metal plate to lie in a substantially horizontal plane at a welding station, positioning at least one reinforcing element at a buffer station generally located adjacent said welding station, reciprocally moving a carriage along a generally linear path between said welding station and said buffer station, said carriage having mounted thereon welding means and means for releasably gripping said reinforcing elements, moving said carriage from said buffer station to said welding station to transport to said welding station into welding positions reinforcing elements gripped by said gripping means of said carriage at said buffer station, pressing against said plate and simultaneously welding to said plate the reinforcing elements positioned at said welding station by operation of said welding means while moving said carriage from said welding station to said buffer station and simultaneously causing said gripping means to engage reinforcing elements positioned at said buffer station, and returning said carriage to said welding station to move thereto into welding position subsequent reinforcing elements to be welded.

3,946,934

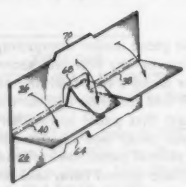
MULTI-PLY PANEL WITH STACKING TAB

John Michael Chaffers, Longview, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Jan. 2, 1975, Ser. No. 537,972

Int. Cl.[2] B65D *13/00*

U.S. Cl. 229—23 R 5 Claims



1. a single piece containerboard blank for forming a multiply wall panel having at least one stacking tab extending upwardly from the top edge, comprising:

a tab panel having a substantially rectangular planar shape and a pair of opposed side edges together with top and bottom edges that are interrupted,

a second panel having a rectangular shape substantially similar to the tab panel and connected thereto along the top edge by a score line having an interruption therealong generally colinear with the interruption along the top edge of the tab panel, and

at least one stacking tab blank positioned within and cut substantially from the planar tab panel, comprising:

a first base portion connected to the second panel and extending outwardly from a line substantially colinear with the score line at the interrupted portion thereof and terminating in a first top portion, and

a second top portion connected to the first top portion by a score line and extending outwardly therefrom and terminating in a second base portion, whereby the tab panel can be folded to overlay the second panel while the second top and base portions of the stacking tab blank can be folded to overlay a portion of the second panel.

3,946,935

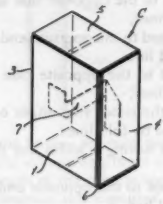
BULK MATERIAL PACKAGING CONTAINER

Bruno C. Bonczyk, East Alton, Ill., assignor to Alton Box Board Company, Alton, Ill.

Continuation of Ser. No. 227,032, Feb. 17, 1972, abandoned. This application Sept. 21, 1973, Ser. No. 399,173

Int. Cl.[2] B65D *5/02*, *5/44*

U.S. Cl. 229—37 R 6 Claims

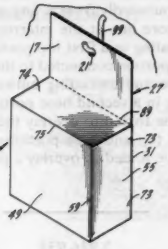


1. In a blank for a packaging container of the type formed from paperboard and incorporating means for adhering to a pair of opposing wall panels to prevent container bulging when laden with bulk material, said blank having a pair of front and back wall panels, a pair of side wall panels for interconnecting between said front and said back wall panels when the blank is formed into a container, said means comprising a strut adhering to a pair of opposing wall panels when the blank is formed into a container, and upper and lower end flaps attached respectively to at least one upper and lower edge of the said panels, a connecting flap formed integrally adjacent an edge of one of said panels, said strut formed having its length dimension that is capable of spanning the distance between the front and back wall container panels being arranged in adjacency and substantially parallel with and removably attached to one of said panel and connecting flap along its vertical dimension, and said strut incorporating at least one fold line angularly disposed with respect to the vertical dimension of said panels to provide for an angular turn in said strut during container assembly, whereby said strut is sequentially removed from said parallel panel or connecting flap and folded to a perpendicular position for adherence to opposite panel walls as said panels and said flaps are folded into the container.

3,946,936
PAPERBOARD BLANK AND CARTON

Lyman J. Brown, La Grange, Ill., assignor to Bates Printing Specialties, Inc., Cicero, Ill.

Filed Oct. 4, 1974, Ser. No. 512,346
Int. Cl.² B65D *5/08, 25/22*
U.S. Cl. 229—38 **3 Claims**



1. An elongated foldable, one piece paperboard blank for a pegboard hanging carton for merchandise, including:
- a hanger panel located at each end of said blank,
- said hanger panels each having an aperture formed therein adjacent to opposite end edges thereof with said apertures adapted to be aligned when said panels are positioned in face-to-face relationship to form a two-ply hanger member,
- a rear panel hinged to one end edge of one of said hanger panels by a perforated fold line,
- a bottom panel hinged to the opposite end edge of said rear panel by a fold line,
- side flaps hinged to the opposite side edges of said bottom panel by fold lines,
- a front panel hinged to the opposite end edge of said bottom panel by a fold line,
- side flaps hinged to the opposite side edges of said front panel by fold lines,
- a tab hinged to the outer side edges of each of said front panel side flaps by fold lines,
- each of said tabs having a width less than the width of its flap,
- a top panel hinged to the opposite end edges of said front panel by a fold line,
- side flaps hinged to the opposite side edges of said top panel by fold lines,
- said opposite end edge of said top panel being hinged to the other of said rectangular hanger panels by a perforated fold line, and
- adhesive applied to one of said hanger panels to connect said hanger panels to form said two-ply hanger member.

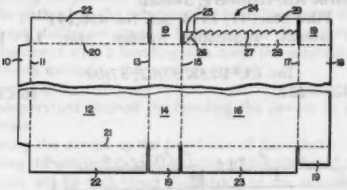
3,946,937
EASY OPENING CARTON

Hampton E. Forbes, Jr., and George Breylinger, both of Wilmington, Del., assignors to Westvaco Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 350,712, April 13, 1973, abandoned. This application Jan. 13, 1975, Ser. No. 540,439
Int. Cl.² B65D *5/54*
U.S. Cl. 229—51 TC **7 Claims**

1. A rectangular paperboard carton of thin profile, having a depth dimension from front-to-back substantially less than its width dimension from side-to-side, and consisting of a plurality of side walls with closure flaps attached to the free ends thereof, said closure flaps including a pair of opposed secondary flaps foldably attached to the side walls along the depth dimension of said carton and a pair of opposed primary flaps including a lowermost primary flap and an uppermost primary flap foldably attached to the side walls along the width dimension of said carton, said opposed primary flaps each having a length dimension less than the depth dimension of said carton so as to only partially overlap one another at their extreme free edges when folded and secured together, the improvement residing in an easy opening means applied to the uppermost one of said primary closure flaps, said easy opening means comprising:

a. a single, substantially straight perforated tear line in the uppermost primary closure flap located near the extreme free edge thereof so as to lie along the width dimension of said carton at or near the geometric center of the depth dimension of said carton in its erected condition;



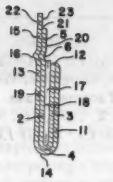
b. said perforated tear line commencing at one edge of said uppermost primary closure flap and continuing in said closure flap along the width dimension of said carton to the opposite edge of said uppermost primary flap; and,

c. at least one unsecured carton opening tab integral with and wholly formed within said uppermost primary closure flap at one side thereof, said carton opening tab being defined by a fold line in said uppermost primary closure flap that extends from one edge of said primary closure flap to intersect said perforated tear line whereby the carton is opened by inserting a opening means underneath the unsecured carton opening tab so as to tear the uppermost primary closure flap along the single perforated tear line.

3,946,938
TWO PIECE MAILER

Richard Kranz, Prairie Village, Kans., assignor to Tension Envelope Corporation, Kansas City, Mo.

Filed Sept. 18, 1974, Ser. No. 506,960
Int. Cl.² B65D *27/06*
U.S. Cl. 229—73 **3 Claims**



1. A multiple piece mailer comprising:

a. an envelope having first and second panels attached to each other along a first fold line and respectively folded along said first fold line against one another to define a pocket, said first panel having an inside surface facing said second panel and an outside surface facing away from said second panel, said second panel having a perforated fold line spaced from said first fold line,

b. said first panel having a portion extending beyond said pocket forming a closure flap for said pocket, said pocket closure flap having an inside surface exposed toward said pocket,

c. a third panel attached to said second panel along said perforated fold line and folded along said perforated fold line against said second panel and along said pocket,

d. a fourth panel attached to said third panel along a second fold line and folded along said second fold line against said first panel outside surface, said first and second fold lines being in juxtaposed relationship with each other, said fourth panel having a portion extending beyond said pocket closure flap and forming a folder closure flap, said folder closure flap having an inside surface exposed toward said pocket and adjacent said pocket closure flap inside surface, and

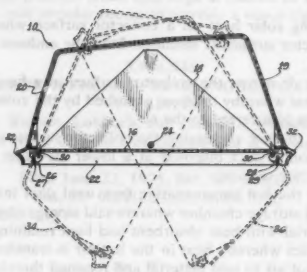
e. seal adhesive on said folder closure flap inside surface and pocket closure flap inside surface,

f. the length of each of the second and third panels measured from the perforated fold line toward the second fold line being substantially equal and the length of each of the first and fourth panels measured from the closure flaps toward the second fold line being substantially equal.

3,946,939
MAILBOX

Edward J. Schifman, Nashville, Tenn., assignor to Aladdin Industries, Inc., Chicago, Ill.

Filed Apr. 15, 1974, Ser. No. 461,103
Int. Cl.² A47G *29/12*
U.S. Cl. 232—17 **9 Claims**



1. A weather protected mailbox which may be opened from either of two ends comprising:

a. a rectangular platform having a front and rear end and a pair of upright side members for receiving mail thereon;

b. a cover pivotally mounted to said upright side members completely enclosing said platform; and

c. front and rear latch means provided on said cover to engage said front and rear ends of said platform for securing said cover in the enclosing position,

said latch means engaging the underside of said platform to prevent upward movement of each end of said cover while permitting downward movement thereof,

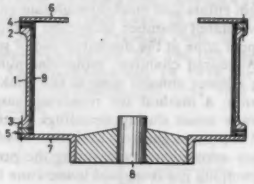
whereby said cover is movable to permit access to either end of the platform by operation of one of said latch means.

3,946,940
CENTRIFUGAL BASKET

Takaya Tadokoro, Chiba, Japan, assignor to Tsukishima Kikai Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 367,338, June 5, 1973, abandoned. This application Nov. 22, 1974, Ser. No. 526,260
Claims priority, application Japan, June 20, 1972, 47-61701
Int. Cl.² B04B *15/06*
U.S. Cl. 233—2 **9 Claims**

1. A centrifugal separator basket construction comprising a rotatable imperforate shell having a center axis, first and second open ends, opposite end walls, including at least one offstanding flange portion formed on at least one of said end walls thereof; at least one exchangeable perforate ring means having a series of open, fluid drainage openings of fixed open cross section disposed therein radially with respect to said center axis of said shell; means fixing said ring means to at least one of said end walls; first cover means positioned fixedly

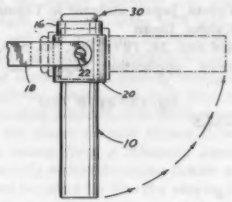


to said ring means for closing said first open end; second cover means positioned for closing said second open end; means for securing said second cover means to said shell; and drive means coupled to said second cover means for rotating said shell about said center axis.

3,946,941
CENTRIFUGING APPARATUS

Gunther Weiss, 2025 SW. Briggs Court, Beaverton, Oreg. 97005

Filed Sept. 25, 1974, Ser. No. 509,233
Int. Cl.² B04B *5/00*
U.S. Cl. 233—26 **9 Claims**



1. A centrifuge tube having an open top end and a closed bottom end, said tube comprising inner and outer walls extending along the length of the tube in spaced-apart concentric, substantially cylindrical side expanses, said walls adjacent the bottom end of the tube continuing from said side expanses in spaced bottom expanses that close off the bottom end of the tube,

said walls joining at the top of the tube through a radially outwardly flaring lip region with said inner and outer walls in said lip region both flaring radially outwardly from the said substantially cylindrical side expanses of said walls and thence curving to meet each other in a zone extending circumferentially about said open top end, said zone where said inner and outer walls join being disposed radially outwardly of the outer surface of the side expanse of said outer wall,

the space between said walls being evacuated.

3,946,942
GAS CENTRIFUGE PURGE METHOD

Gordon R. Theurich, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed July 12, 1963, Ser. No. 294,774
Int. Cl.² B04B *1/00*
U.S. Cl. 233—40 **5 Claims**

1. In a method of separating isotopes in a high speed gas centrifuge wherein a vertically oriented cylindrical rotor bowl is adapted to rotate about its axis within an evacuated chamber, and wherein an annular molecular pump having an intake

end and a discharge end encircles the uppermost portion of said rotor bowl, said molecular pump being attached along its periphery in a leak-tight manner to said evacuated chamber, and wherein end cap closure means are affixed to the upper end of said rotor bowl, and a process gas withdrawal and insertion system enters said bowl through said end cap closure means, said evacuated chamber, molecular pump and end cap defining an upper zone at the discharge end of said molecular pump, said evacuated chamber, molecular pump and rotor bowl defining a lower annular zone at the intake end of said molecular pump, a method for removing gases from said upper and lower zones during centrifuge operation with a minimum loss of process gas from said rotor bowl, comprising, in combination: continuously measuring the pressure in said upper zone, pumping gas from said lower zone from the time the pressure in said upper zone equals a first preselected value until the pressure in said upper zone is equal to a second preselected value, said first preselected value being greater than said second preselected value, and continuously pumping gas from said upper zone from the time the pressure in said upper zone equals a third preselected value until the pressure in said upper zone is equal to a fourth preselected value, said third preselected value being greater than said first, second and fourth preselected values.

3,946,943

COOLING SYSTEM OF AN INTERNAL COMBUSTION ENGINE INCORPORATING A BY-PASS FLOW CONTROL SYSTEM

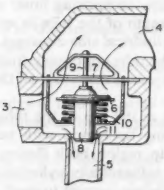
Kyo Hattori, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Jan. 24, 1975, Ser. No. 543,893

Claims priority, application Japan, Oct. 8, 1974, 49-121389[U]

Int. Cl.² F01P 7/02

U.S. Cl. 236—34.5 **3 Claims**



1. A cooling system of an internal combustion engine comprising a main cooling water flow circuit which connects a water jacket of the engine with a radiator, a by-pass circuit which allows for a flow of cooling water to by-pass said radiator, and a thermostat valve incorporated in said main cooling water flow circuit and adapted to open or close so as to uninterrupt or interrupt said main cooling water flow circuit in response to high or low temperature of the cooling water, said thermostat valve having a wax cylinder and a valve member which is driven by said wax cylinder when said cylinder is biased due to melting or solidifying of wax contained in said cylinder, characterized by a second valve port formed as a cylindrical bore means adapted to receive said wax cylinder when said cylinder has been biased in a direction to open said thermostat valve, said by-pass circuit being led through said second valve port.

3,946,944

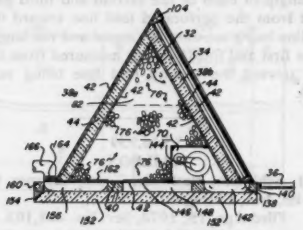
METHOD OF HEATING A BUILDING STRUCTURE WITH SOLAR HEAT

John Harold Keyes; Charles Irvin Strickland, and Robert George Strickland, all of Nederland, Colo., assignors to International Solarthermics Corporation, Nederland, Colo.

Division of Ser. No. 445,473, Feb. 25, 1974. This application Oct. 16, 1974, Ser. No. 515,236

Int. Cl.² F24D 11/00

U.S. Cl. 237—1 A **4 Claims**



1. A method of heating a building structure comprising the steps of:

absorbing solar heat on a collector surface wherein said collector surface is insulated from the ambient environment,

passing air across the collector surface in a heat transfer process whereby the heat absorbed by the collector surface is transferred to the air,

passing the hot air leaving the collector surface through a horizontal duct disposed at a lower elevation than the collector surface,

passing the hot air emanating from said duct into an elevated storage chamber wherein said storage chamber has material with heat absorbent and heat retaining characteristics whereby heat in the hot air is transferred from the hot air to said material and retained thereby, and

intermittently directing a utility flow of fluid from said storage chamber into the building structure via a duct disposed at a lower elevation than said storage chamber to reduce the temperature differential between the interior of the building structure and the interior of the storage chamber.

3,946,945

DISPENSING CONTAINER AND REFILL FOR AN AIR TREATING GEL

Raymond C. Odioso, Cincinnati, Ohio; William T. Riley, Harrison, Ind., and David A. Jones, Bellbrook, Ohio, assignors to The Drackett Company, Cincinnati, Ohio

Filed July 14, 1975, Ser. No. 595,460

Int. Cl.² A24F 25/00; A61L 9/04

U.S. Cl. 239—58 **5 Claims**

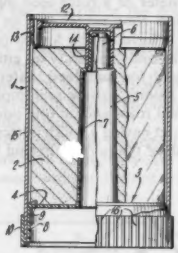
1. A dispensing container for an air treating gel comprising:

A. a base member of relatively flat and circular contour having a raised circular gel-supporting surface having a first stem located at the center of the surface projecting vertically upward therefrom, said first stem having a relatively short upper portion having a substantially smaller diameter than the lower portion, said surface having a cylindrical side wall providing a lip portion about the circumference of said surface, said wall being integrally connected at its lowermost portion to the lowermost portion of a second cylindrical wall laterally offset therefrom to provide an annular recess about the circumference of said surface;

B. a top member of relatively flat and circular contour having a cylindrical side wall disposed about its circumference, said top member having a second central hollow

stem for insertion therein of the upper portion of said first stem; and

C. a tubular-walled member capable of slideably engaging the outer surface of the top side wall member while the base member first stem and top member second stem

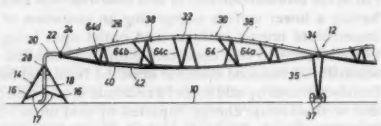


remain fixedly engaged, whereby the vertical displacement of the lowermost edge of said tubular-walled member relative to the base member can be varied to obtain a plurality of open positions and can be adjusted to a fully closed position when said edge is caused to be inserted into said annular recess to provide a vapor-tight seal.

3,946,946
SELF PROPELLED SPRINKLING IRRIGATION APPARATUS

James E. Hansen, Lubbock, and James L. Jackson, Houston, both of Tex., assignors to Gifford-Hill & Company, Inc., Dallas, Tex.

Filed June 23, 1975, Ser. No. 589,143
Int. Cl.² A01G *25/02*; B05B *3/00*
U.S. Cl. 239—177 **7 Claims**



1. Self-propelled sprinkling irrigation apparatus for irrigating large land areas, said apparatus comprising:

a pipeline having a plurality of interconnected pipe spans having sprinkler mechanisms carried thereby for distribution of water;

a pair of tension elements for each pipe span, said tension elements having the extremities thereof connected adjacent the extremities of said pipe spans;

a plurality of pairs of load supporting elements for each of said pipe spans being spaced along the length of each respective pipe span, said pairs of load supporting elements being secured at one extremity thereof to said pipe span and extending in downwardly diverging relation from said pipe span, the lower extremities of said load supporting elements being connected to respective ones of said pair of tension elements;

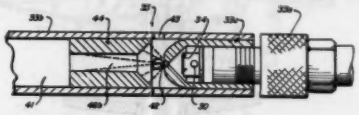
transverse brace means being interposed between each of said pairs of load supporting elements and maintaining said load supporting elements in stabilized diverging relation; and

a single stabilizer brace element for each of said pairs of load supporting elements, each of said stabilizer braces extending between said pipe span and one of said tension elements and being disposed in angular relation with said pipe span, said load supporting elements and said tension element, said stabilizer elements of successive pairs of said load carrying elements being connected to opposite ones of said tension elements.

3,946,947
FOAM GENERATING APPARATUS

Barry L. Schneider, Crystal Lake, Ill., assignor to Chemtrust Industries Corporation, Franklin Park, Ill.

Continuation-in-part of Ser. No. 396,183, Sept. 11, 1973, abandoned. This application Nov. 14, 1974, Ser. No. 523,740
Int. Cl.² B05B *1/30, 1/34, 7/04*
U.S. Cl. 239—401 **20 Claims**

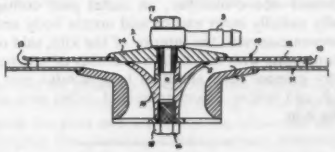


1. An adjustable foam generating nozzle assembly comprising, in combination: body means defining an inlet section through which an unaerated liquid can pass, said inlet section including outlet orifice-forming means through which unaerated liquid passes for providing a diverging stream flowing therefrom; said body means further defining a foam-producing section downstream from said inlet section which foam-producing section has an inlet end which receives the entire variably shaped stream issuing from said outlet orificeforming means, air inlet port-forming means in communication with the exterior of the nozzle assembly and pressure-reducing passageway means communicating with said air inlet port-forming means and said inlet end for effecting the aspiration of air through said air inlet port-forming means and the mixing thereof into the liquid stream passing through the pressure-reducing passageway means; and said inlet section of said body means including manually adjustable means for progressively varying the shape of said stream flowing from said orifice-forming means from a relatively narrowly confined stream to a relatively widely diverging stream as the manually adjustable means is varied for thereby varying the portions of the pressure-reducing passageway struck by the stream, the turbulence produced in the aerated stream passing therethrough, the degree of foam thickness and the throw of the stream flowing from the nozzle assembly.

3,946,948
EJECTOR

Dick Axel Hörlin, Grangesberg, Sweden, assignor to Grangesbergs Industrivaru AB, Grangesberg, Sweden

Filed Oct. 18, 1974, Ser. No. 516,134
Int. Cl.² B05B *1/32*
U.S. Cl. 239—453 **9 Claims**

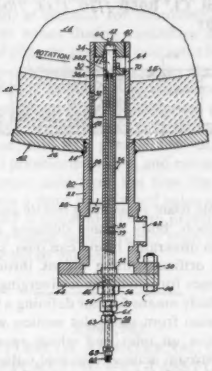


1. An ejector comprising a nozzle for a motive fluid opening into a mixing zone, and a diffusor downstream of the mixing zone for the motive and entrained fluids, wherein the motive jet nozzle is annular and has its mouth substantially radially outwardly directed, and the diffusor consists of two spaced plates or discs, the nozzle being directed between the plates which are so arranged relative to one another that the cross sectional area between them increases in a radial sense, as viewed from the nozzle.

3,946,949
NOZZLE FOR ROTARY KILN

Eugene F. Rossi, Wauwatosa, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Sept. 4, 1974, Ser. No. 503,135
Int. Cl.² B05B 1/00; C21B 7/16; C21C 5/48
U.S. Cl. 239—600 **22 Claims**



1. A nozzle for use with a rotary kiln of the type used for reducing ore to a lower state of oxidation, including a hollow nozzle body adapted to extend through the kiln wall from the exterior of the kiln to finally communicate with the interior of the kiln, means forming a closure for said nozzle body at the normally radially outer end thereof (relative to the kiln axis), a nozzle tip forming a closure contiguous the normally radially inner end of said nozzle body, a fluid passage for liquid fluid through said nozzle tip, a hollow sleeve member extending through said nozzle body for substantially the entire length of said nozzle body at least to said nozzle tip and being in fluid communication with said fluid passage through said nozzle tip, said sleeve member being spaced radially inwardly from the inner surface of said nozzle body relative to the longitudinal axis of said nozzle whereby to define a hollow chamber between said sleeve member and said nozzle body, a liquid fuel tube slidably received within the hollow interior of said sleeve member and slidably movable into cleaning relation to said nozzle tip, said liquid fuel tube being adapted to be connected contiguous a radially outer end thereof to a source of liquid fuel, an inlet port in said nozzle body for admitting a gaseous fluid into the hollow chamber of said nozzle body which surrounds said sleeve member, an outlet port contiguous the normally radially inner end of said nozzle body and adapted to communicate with the interior of the kiln, said outlet port communicating with said hollow chamber of said nozzle body whereby gaseous fluid admitted to said inlet port may pass through said hollow chamber to said outlet port and thence into the kiln.

3,946,950
MATERIAL REDUCER

Carl R. Graf, Whitehall, Pa., assignor to Pennsylvania Crusher Corporation, Broomall, Pa.

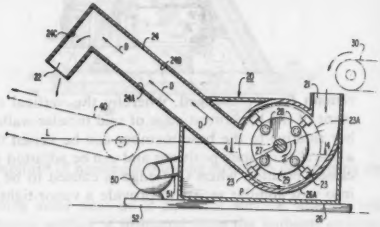
Continuation-in-part of Ser. Nos. 185,760, Oct. 1, 1971, abandoned, and Ser. No. 267,915, June 30, 1972, abandoned. This application May 16, 1973, Ser. No. 361,002
Int. Cl.² B02C 13/04
U.S. Cl. 241—18 **10 Claims**

1. A rotary impact mill for mineral materials such as coal, lignite, ore, stone, rock, oil shale and the like, comprising:

a. a rotor, having pivoted impact hammer means mounted thereon for reducing said mineral materials by impact therewith, the periphery of which defines an impactor circle;

b. a housing rotatably supporting said rotor and having a curved imperforate impact surface which defines the outer perimeter of a rotor-feed material-impact surface inter-reaction zone subtending an arc in said impactor circle which includes the lowest point in said impactor circle and extends upwardly on either side of said point;

c. an inlet duct for said feed material opening into said housing at a point outside said impactor circle above the center of said rotor and on one side of said lowest point, said inlet duct having a width corresponding substantially to the width of the portion of said housing in which said



impact hammer means rotate, whereby said impact hammer means strike said feed material as it drops into said impactor circle to reduce said material;

d. an outlet duct for reduced material opening from said housing at a point below said center of said rotor and on the other side of said lowest point, said outlet duct defining a reduced material departure path generally corresponding to the trajectory imparted to said reduced material at the downstream end of said inter-reaction zone and having a lower surface comprising an extension of said imperforate impact surface, said outlet duct being oriented relative to said departure path so as to allow substantially all reduced material impelled from said impact hammer means by said rotor to continue in said trajectory due to the kinetic energy imparted by said impact hammer means; and

e. direction changing and energy absorbing means associated with said outlet duct and oriented in said material departure path in a position for receiving at least the larger pieces thrown off by said rotor, for slowing such pieces by absorbing a major portion of said kinetic energy, and for discharging such material from said outlet duct without recycling to said rotor.

10. A method of crushing massive, high density materials such as coal, lignite, ore, stone, rock, oil shale and the like, comprising the steps of:

introducing mineral feed into a housing through an inlet open to the atmosphere;

allowing the mineral feed to drop from said inlet into the impactor circle of a rotor rotating within said housing, said rotor having impact hammer means for reducing said mineral feed by impact therewith, said hammer means defining said impactor circle and said mineral feed dropping into said impactor circle at a location above and to one side of the center of said impactor circle;

impacting said feed material with said rotating impact hammer means as said feed material drops into said impactor circle to crush said material;

causing said reduced material to move into contact with an imperforate impact surface in a rotor-feed material-impact surface inter-reaction zone subtending an arc including and extending upwards from either side of the lowest point in said impactor circle, to further crush said

material;

throwing substantially all material crushed by said rotor and said imperforate impact surface upwardly and outwardly from said rotor on the side of said lowest point opposite to the side on which said mineral feed drops into said impactor circle, along an at least partially confined channel defining a departure path generally corresponding to the trajectory of the material at the downstream end of said inter-reaction zone utilizing the kinetic energy imparted thereto by said rotor, to a level above the axis of rotation of said rotor;

while the crushed material is still in flight, impinging at least the largest pieces thereof against an energy absorbing and direction changing means; and

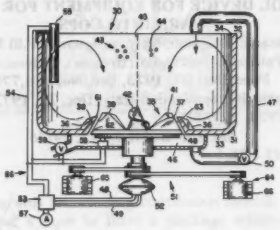
causing the crushed material to descend from said energy absorbing and direction changing means and to discharge from the apparatus without further contact with said rotor.

3,946,951

ATTRITION PULPER HAVING HIGH LEVEL THRUST FOR GRINDING PULP AND REFINING FIBRES

Donald W. Danforth, Andover, Mass., assignor to Bolton-Emerson, Inc., Lawrence, Mass.

Filed June 21, 1974, Ser. No. 481,491
Int. Cl.² B02C *23/26*
U.S. Cl. 241—21 **2 Claims**



1. The method of treating unconventional pulp in a vortical circulation pulper having a bladed and channeled stator and rotor with a fixed interface clearance, the rotor driven at a predetermined horsepower and the pulp being recirculated by the pumping action at said interface, which comprises the steps of:

charging said pulper with unconventional pulp; such as, flax, hemp, rags, leather or the like;

then advancing said rotor to zero clearance, increasing said horsepower at least fifty percent to achieve sufficient thrust and exerting a grinding action to refine and develop the fibres in such unconventional pulp, in a predetermined time;

then automatically sensing that said fibres have been refined to a predetermined standard;

and then backing off said rotor and discharging said refined pulp from said pulper.

3,946,952

HAMMER MILLS

Elam M. Martin, R.R. No. 3, Wallenstin, Ontario, Canada

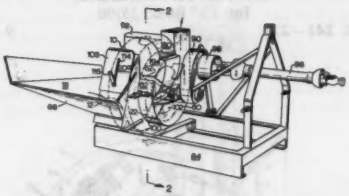
Continuation of Ser. No. 255,009, May 19, 1972, abandoned. This application June 11, 1974, Ser. No. 478,270
Int. Cl.² B02C *23/24*
U.S. Cl. 241—56 **17 Claims**

1. A feed grinder characterized by having in operative combination:

i. a generally cylindrical-walled grinding chamber having an entrance opening, and grinding means within said chamber for grinding feed in a single pass of said feed through said chamber,

ii. means for guiding and controlling the feed admited to said chamber,

iii. means for varying the smoothness of a portion of the inner surface of the cylindrical wall



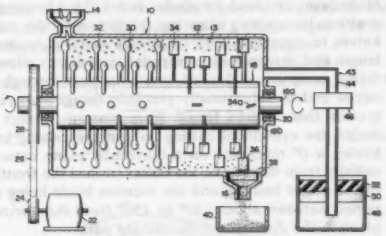
thereof, said smoothness varying means embodying a recess in said wall, channel-stock means having a web connecting depending flanges and means for accommodating said channel-stock means within said recess with either the web or flanges of siad channel-stock means being accurately co-incident with said inner cylindrical wall surface.

3,946,953

CRUSHER FOR BREAKING DISCARDED GLASS ARTICLES INTO GEM-LIKE GRANULES

Kuniki Hato, Imabari, Japan, assignor to Nobutoshi Ohuchi, Japan

Filed Oct. 30, 1974, Ser. No. 519,283
Int. Cl.² B02C *13/13*
U.S. Cl. 241—79.2 **11 Claims**



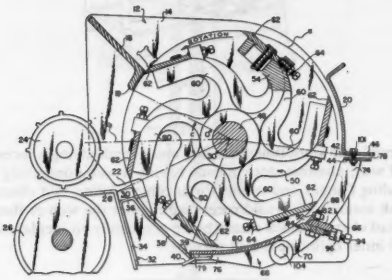
1. A crusher for breaking discarded glass articles into gem-like granules, comprising a housing having at one end an inlet for charging the glass articles and at the other end an outlet for discharging the granules; a rotary means rotatably supported on both ends of the housing, means for driving the rotary means; crushing means mounted on the outer surface of the rotary means and adapted to kick the glass articles toward the inner surface of the housing to cause them to be broken into fragments; selector means disposed at the outlet of the housing and selectively passing granules having a particle size less than a predetermined particle size; and recoiling means mounted on the rotary means and substantially above the outlet of the housing to cause glass fragments accumulated over the selector means to be kicked toward said one end of the housing.

3,946,954

SINGLE BLADE RECUTTER FOR FORAGE HARVESTER

Eugene A. Sousek, Appleton, Wis., assignor to Koehring Company, Milwaukee, Wis.

Division of Ser. No. 309,678, Nov. 27, 1972, Pat. No. 3,817,464. This application Jan. 24, 1974, Ser. No. 436,141
The portion of the term of this patent subsequent to June 18, 1991, has been disclaimed.
Int. Cl.² B02C *18/06*
U.S. Cl. 241—222 9 Claims



1. A forage cutter for cutting forage material comprising:
a. a housing including a front wall terminating in a forward inlet for receiving forage material and a back wall having an outlet for discharging forage material;
b. a rotary cylindrical cutter mounted for rotation about its longitudinal axis in the housing and having a plurality of cutting knives movable in a cylindrical cutting path;
c. a stationary shear bar adjacent said inlet and positioned in coacting shearing relation with the cutting knives; and
d. a recutter having only one recutter blade, said cutter blade being disposed across the outlet of the housing and position in coacting shearing relation with the cutting knives to simultaneously cut forage material to desired length and screen forage material in order to allow the forage material of desired length to pass through said outlet and to substantially preclude forage material of greater than desired length from passing through said outlet, the cylindrical cutting path of the cutting knives having a 0° reference on a horizontal plane extending radially from the axis of the cutter toward the front wall of the cutter housing and the recutter blade being positioned between about 120° to 150° from the horizontal plane in the direction of the cutting path.

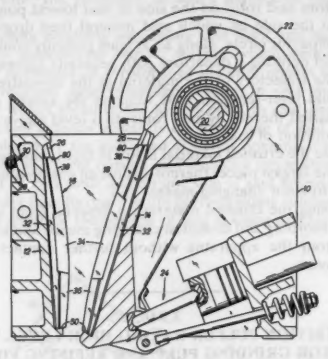
3,946,955

MULTIPLE SECTION WEAR PLATE FOR A ROCK CRUSHER

Richard S. Bond, Greenfield, Wis., assignor to Rock Industries Machinery Corporation, Milwaukee, Wis.

Filed Aug. 1, 1974, Ser. No. 493,911
Int. Cl.² B02C *1/02*
U.S. Cl. 241—264 4 Claims

1. In a jaw crusher of the type having a movable jaw, an improved multiple unit die assembly for each of the jaws, each said assembly comprising a support grid having a groove in the front equally spaced from each edge of the grid, a center die section secured in said groove in said support grid and a pair of symmetrical end sections positioned on said support grid and having a width equal to the distance between the center section and the edges of said support grid, said end sections including means on the back for engaging said support grid during movement from an assembly point to the jaw crusher,



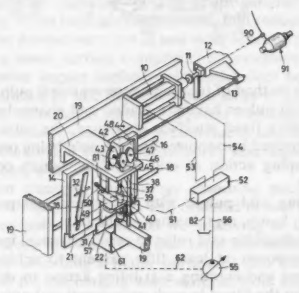
said engaging means comprising a lifting lug on each of said end sections and a corresponding hole in said support grid.

3,946,956

CONTROL DEVICE FOR EQUIPMENT FOR WINDING YARN INTO COPS

Angelo Marzoli, Bergamo, Italy, assignor to F.lli Marzoli & C. S.p.A., Palazzolo Sull'Oglio (Brescia), Italy

Filed Dec. 27, 1973, Ser. No. 428,770
Claims priority, application Italy, Dec. 29, 1972, 33792/72; Aug. 10, 1973, 27785/73
Int. Cl.² B65H *54/32*, *54/36*
U.S. Cl. 242—26.1 6 Claims



1. A control device for controlling the relative movement between a cop and yarn handling and guiding elements in textile spinning and twisting machines so as to wind the yarn upon cops having various shapes comprising a frame, a reciprocable actuator member carried by said frame, a support member slidably carried by said frame, a pair of spaced striker elements adjustably mounted on said support member, control means for regulating the reciprocation of said actuator member along a first predetermined path, said control means including a control member positioned between said striker elements, at least one of said control member and support member being operatively connected to said actuator so as to provide for alternating engagement of said striker elements by said control member for regulating the reciprocation of said actuator member along said first predetermined path, drive means for reciprocating said control member relative to said support member along a second predetermined path which is perpendicular to said first path and generally parallel to the

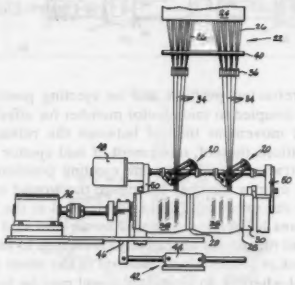
plane in which said striker elements are disposed whereby said control member is engageable with different lineal portions of said striker elements, second control means being provided for reversing the relative motion of said control member and support member along said second predetermined path including limit sensor means and a contacting element carried by said control member engageable therewith at predetermined positions along the second path of movement of said control member.

3,946,957

TRAVERSING MECHANISM

Paul Richard Van Gunten, Toledo, and John Gilbert Mohr, Maumee, both of Ohio, assignors to Johns-Manville Corporation, Denver, Colo.

Filed Sept. 26, 1973, Ser. No. 401,015
Int. Cl.² B65H *54/28*
U.S. Cl. 242—43 R **2 Claims**



1. An apparatus for winding continuous strands of flexible material about a core to form a package which apparatus includes a source of said strands, means for rotating said core about a first axis, a traversing mechanism rotatable about a second axis parallel to said first axis and adjacent to a peripheral surface of said package for imparting primary traversing motions to said strands as they are being wound on said package whereby said strands progress and regress to define a series of bights, and means for imparting a secondary traversing motion to the strands relative to the package to advance the series of bights across the peripheral surface of the package, the improvement comprising: said traversing mechanism comprising at least six elongate straight rods having rounded surfaces for contacting said strands, support means supporting said elongate rods in spaced-apart parallel relationship to define a cylindrical pattern, mounting means for mounting said mechanism so that the axes of said elongate rods extend at an oblique angle of about 30° to 45° relative to said second axis about which said traversing mechanism is rotated.

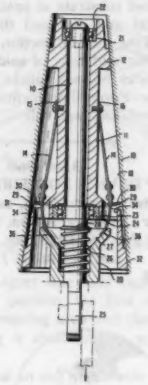
3,946,958

ROTATABLE YARN WINDING SPINDLE

Julian B. Chavis, Box 939, Gastonia, N.C. 28052

Continuation of Ser. No. 285,103, Aug. 30, 1972, abandoned.
This application June 19, 1974, Ser. No. 480,757
Int. Cl.² B65H *75/30*
U.S. Cl. 242—46.3 **5 Claims**

1. In a yarn winder, the combination comprising:
a a spindle means;
b a cone holder support means for supporting a cone member, said cone holder support means including upper and lower recesses serving to support first and second roller bearing means and arranged for rotary movement on said spindle;
c two spring finger means, each said spring finger means having upper and lower extremities, said upper extremity fastened to and at diametrically opposed sides of said cone holder support means;
d. spring finger actuating means, each said lower extremity disposed on said spring finger actuating means for pivotal movement thereof upon actuation of said spring finger actuating means; and



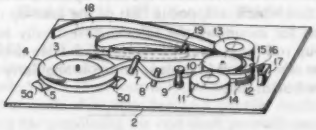
e blade means disposed on each said spring finger means having an arcuately shaped substantially flat outer surface in the direction of curvature of said cone member, each said blade means rigidly secured intermediate the ends thereof to its respective finger means, said flat surface adapted to engage and retain said cone member about one line of its inner periphery without deformation or penetration of said cone member.

3,946,959

ENDLESS TAPE-RUNNING APPARATUS

Norikazu Sawazaki, Yokohama; Hiroyuki Tsukamoto, Kawasaki, and Motoi Yagi, Zushi, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Mar. 28, 1974, Ser. No. 455,743
Claims priority, application Japan, Apr. 4, 1973, 48-37747; Apr. 28, 1973, 48-47353
Int. Cl.² B65H *17/48*
U.S. Cl. 242—55.19 A **5 Claims**



1. A magnetic recording and reproducing apparatus comprising: a substrate;
a rotatable reel mounted on said substrate;
an endless magnetic tape wound about said rotatable reel to form an endless tape roll thereon, said endless magnetic tape having a length less than 300 meters;
a non-rotatable magnetic head;
guide means for drawing out the tape from said endless tape roll, starting with the innermost periphery of said tape roll and guiding the drawn out tape so as again to take it up on the outermost periphery of said tape roll, said guide means including a rotatable capstan and two pinch rolls disposed on opposite sides thereof so that the tape passing between the capstan and one of the pinch rolls is scanned

by said magnetic head and passes between the capstan and the other pinch roll;

drive means for running the drawn out tape at a speed greater than 5 meters per second through said guide means; and

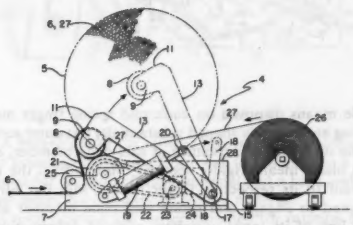
a plurality of rollers, at least the peripheral surfaces of which are rubber, being horizontally disposed on the surface of said substrate at spaced intervals around said rotatable reel and disposed therebeneath, said rollers extending in the radial direction of said rotatable reel, so that the lower end face of said tape roll contacts said rubber surfaces of said rollers, whereby said tape roll receives a force opposing a centrifugal force generated on the rapidly rotating tape roll.

3,946,960

WIND-UP DEVICE FOR TIRE CORD FABRIC

Edward E. Hunter, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Feb. 19, 1975, Ser. No. 551,228
Int. Cl.² B65H 17/08
U.S. Cl. 242—65 **9 Claims**



1. A device for winding up a sheet of tire cord fabric, comprising:

a. a take-up roll on which a sheet of fabric is coiled;

b. a drive roll adjacent the take-up roll for rotating the take-up roll in a direction for coiling fabric thereon;

c. means for mounting the drive roll for at least partially supporting the take-up roll and fabric coiled therearound;

d. means for causing relative movement of the rolls to maintain, as closely as possible, a predetermined pressure between fabric on the take-up roll and the drive roll, as the roll of fabric increases in size and weight;

e. an idler roll adjacent the take-up roll for first engaging the fabric and guiding it immediately on to the take-up roll, the idler roll being rotatable freely about its own axis by the fabric as it moves on to the take-up roll and in a rotary direction which is opposite that of the take-up roll; and

f. means for mounting the idler roll vertically below the take-up roll for guiding fabric upwards from the idler roll to the take-up roll in a plane which is angularly disposed to the horizontal.

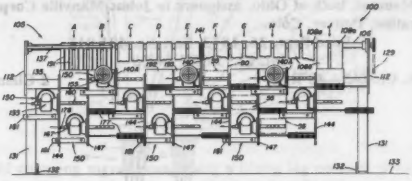
3,946,961

AUTOMATIC TOWEL WINDING MACHINE

Erwin B. Bahnsen, Oakbrook, Ill., assignor to Steiner American Corporation, Salt Lake City, Utah

Continuation of Ser. No. 299,341, Oct. 20, 1972, abandoned, which is a division of Ser. No. 22,447, March 25, 1970, Pat. No. 3,761,032. This application Aug. 15, 1974, Ser. No. 497,555
Int. Cl.² B65H 17/00
U.S. Cl. 242—67.1 R **2 Claims**

1. An elongated towel winder comprising a support frame, a mandrel mounted at one end thereof on said frame and rotatable about the longitudinal axis thereof for winding an associated elongated towel into a roll thereon, a constant-torque electric drive motor carried by said frame and coupled to said one end of said mandrel for effecting rotation thereof and maintaining a substantially constant torque thereat, feed apparatus mounted adjacent to said mandrel for feeding an elongated towel to said mandrel, the increasing weight of the towel roll on said mandrel as the diameter of the towel roll increases serving to decrease the rotational speed of said mandrel to maintain a substantially constant tension in the portion of the towel extending between said mandrel and said feed apparatus, and an ejector member carried by said frame adjacent to said mandrel and having an enclosed opening therein for receiving said mandrel therethrough, said ejector member being independently movable axially of said mandrel



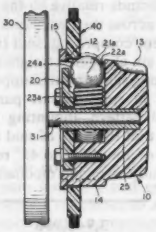
between a retracted position and an ejecting position, and drive means coupled to said ejector member for effecting said independent movement thereof between the retracted and ejecting positions thereof, movement of said ejector member from the retracted position to the ejecting position thereof causing said ejector member to engage the wound towel roll and remove the towel roll from said mandrel at the free end thereof, means interconnecting said motor and said mandrel such that said mandrel is operatively connected to said motor and continues to rotate during removal of the towel roll from said mandrel whereby an elongated towel may be fed to said rotating mandrel and wound in a roll thereon and removed therefrom when the roll is completely wound.

3,946,962

HUB FOR A REEL OF RECORDING TAPE

Norman E. H. Deletzke, Jr., P.O. Box 221, Wilmette, Ill. 60091

Filed May 2, 1974, Ser. No. 466,382
Int. Cl.² B65H 17/02
U.S. Cl. 242—68.3 **2 Claims**



1. A hub, for releasably seating a reel in facing relationship with a turntable having an upwardly extending spindle, comprising:

a housing, including a base portion, a top portion, and an electrically conductive axial standard extending upwardly from said base portion to said top portion for receiving said spindle; said housing defining three internal channels extending radially from said axial standard, each of said channels terminating in an opening defined in the periphery of said housing;

three electrically conductive balls movably disposed in respective ones of said channels; each of said balls being of such diameter as to only partially protrude through a respective opening in the periphery of said housing; and

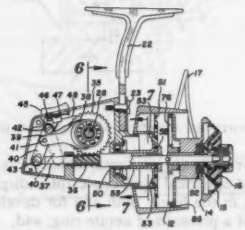
three electrically conductive spring members disposed, respectively, in said channels in contacting relationship between said axial standard and one of said balls, thereby establishing an electrical path from each of said balls, through a respective spring member, to said axial standard for dissipating spurious electrical charges via said spindle; said balls being adapted to retract into said openings against said springs when said reel is moved over said hub and past said openings, and said balls being further adapted to be urged by said springs partially through said openings and against said reel to seat said reel in facing relationship with said turntable.

3,946,963

DRAG ASSEMBLY FOR SPINNING REELS WITH FIXED INDICATOR BEZEL

Gary R. Oberg, Spirit Lake, Iowa, assignor to Berkley & Company, Inc., Spirit Lake, Iowa

Filed Aug. 1, 1974, Ser. No. 493,984
Int. Cl.² A01K *89/00*
U.S. Cl. 242—84.21 R **9 Claims**



1. An open-face spinning reel structure comprising, in combination, frame means, a spindle shaft operatively coupled to said frame means, a line spool assembly including a line spool mounted on said spindle shaft and a spool cap rotor means having a generally open end and being mounted for rotation upon said frame means, line bail means secured to said spool cap rotor means, and drive means mounted on said frame means including main drive gear means for rotating said spool cap rotor and linkage means for reciprocatorily moving said spindle shaft along the axis of said spool cap rotor, said line spool being mounted for rotation upon said spindle shaft with drag assembly means being disposed along said spindle shaft and having means frictionally engaging said line spool for controllably and adjustably accommodating rotation of said line spool upon said spindle shaft;

a. said drag assembly comprising first and second drag means having first and second mutually abutting drag surfaces respectively, with one of said drag means being arranged for rotation with said line spool and with the other being arcuately fixed to said spindle shaft;

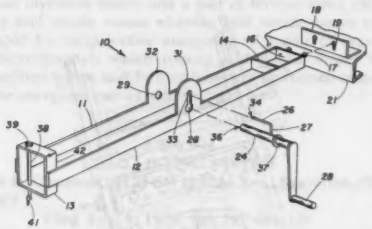
b. indicator bezel means arcuately fixed to said spindle shaft and disposed on said spindle shaft outwardly of said first and second drag means and having axially flexible and forwardly projecting pawl means on the forward surface thereof, and drag adjustment knob means threadedly engaged upon said spindle shaft and having locking detent means complementary to said indicator bezel projecting pawl means and arranged for receiving said pawl means in operative engagement therewith at spaced arcuate dispositions, said indicator bezel having arcuately spaced indicia displayed thereon, and said drag adjustment knob having indicia thereon complementary to said arcuately spaced indicia for indicating the immediate relative dispositions thereof.

3,946,964

HOSE ROLLER

Paul F. Zinser, Box 82, Adams, Decatur County, Ind. 47240

Filed June 12, 1975, Ser. No. 586,258
Int. Cl.² B65H *75/38*
U.S. Cl. 242—86 **8 Claims**



1. Collapsed hose rolling apparatus comprising:

a. a frame including,

1. a pair of spaced-apart side rails each having an enlarged hose-guide portion, the first of said portions including a shaft-bearing area and the second of said portions including a shaft-bearing area defining an opening, and

2. hose-guide means at an end of said side rails for guiding a hose to be rolled;

b. a crank member including,

1. a shaft having a first end received at the shaft-bearing area of said first hose-guide portion,

2. a pin spaced-apart from and extending generally axially along a portion of said shaft between said hose-guide portions and having a connecting portion connecting the pin to the shaft, the opening in the second hose-guide portion being keyed to permit passage of the shaft and of the pin when the pin and shaft are oriented in a particular configuration relative to the second hose-guide portion, and

3. a crank handle; and

c. a collapsed hose engaged by the crank shaft and pin, the hose being rolled around the crank shaft and pin, whereby the crank member may be removed from the frame by proper orientation of the pin relative to the opening in said second hose-guide portion after the hose is rolled, freeing the rolled hose from the apparatus.

3,946,965

VEHICLE SENSITIVE INERTIA RETRACTOR

Harkrishan Singh, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 23, 1974, Ser. No. 535,544
Int. Cl.² B65H *75/48*
U.S. Cl. 242—107.4 R **4 Claims**

1. A seat belt retractor mechanism having a belt reel rotatably mounted on a shaft journalled in a support frame, the reel at each of its ends having a circular ratchet plate, a locking bar paralleling the reel shaft pivotally mounted in the support frame for movement into engagement with the ratchet plates to hold the reel against rotation in seat belt protraction direction, and an inertia sensor comprising a pendulum device engageable with the locking bar to drive the latter into ratchet plate engagement, wherein the improvement comprises:

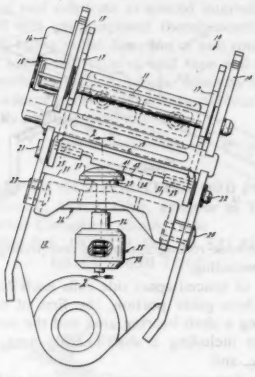
a support bracket on the support frame beneath the locking bar from which the pendulum device is suspended,

the support bracket and pendulum device having coacting gimbal means providing a first universal pivot about which the pendulum device is displaceable from a vertical equilibrium position to a predetermined position in which the pendulum device maintains proximate contact with

the locking bar without causing movement of the latter toward the ratchet plate,

and the support bracket and the pendulum device having further coacting means operative on displacement of the pendulum device beyond a predetermined position providing a second pivot about which the pendulum device is swingable independently of the gimbal means,

the pendulum device upon being swung about the second pivot having a part thereof abutting the locking bar to raise the latter into ratchet plate holding engagement.



3,946,966
AUTOMATIC STOP MECHANISM FOR AN ELECTRIC TAPE APPARATUS

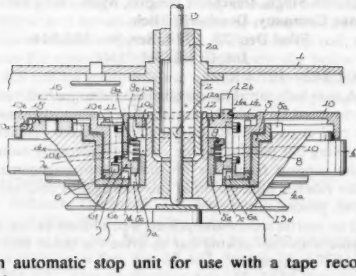
Fumihito Komatsu, Suwa, and Akihiko Isaka, Nagano, both of Japan, assignors to Kabushiki Kaisha Sankyoseiki Seisakusho, Nagano, Japan

Filed Sept. 9, 1974, Ser. No. 504,716

Claims priority, application Japan, Sept. 11, 1973, 48-102957; Oct. 27, 1973, 48-121511; Dec. 28, 1973, 49-1756[U]

Int. Cl.² B65H *59/38*; G03B *1/02*; G11B *15/32*

U.S. Cl. 242—191 **10 Claims**



1. An automatic stop unit for use with a tape recorder, comprising

a fly-wheel;

an idler wheel disposed concentrically relative to said fly-wheel;

clutch means which connects and thereby provides linkage between said fly-wheel and said idler wheel such that, when a braking load greater than a determined magnitude is applied to the idler wheel, said clutch means permit relative rotational slip between said two wheels which disconnects the linkage between said wheels; and

actuator means actuated when the linkage is disconnected between said wheels, said actuator means including an external actuating element.

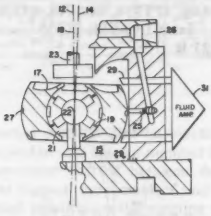
3,946,967
STABILIZED TRANSPORTATION MACHINE

Aubrey Rodgers, Huntsville; Escar L. Bailey, Athens, and Rayburn K. Widner, Arab, all of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 438,919, Feb. 1, 1974, abandoned. This application Feb. 4, 1975, Ser. No. 546,970

Int. Cl.² F41G *7/00*; G01C *19/28*

U.S. Cl. 244—3.2 **5 Claims**



1. A transportation machine for operation in a linear path comprising:

a chassis for enclosing an aerate atmosphere and a regular frustumed spherical gyroscopic rotor disposed for axial direction in the linear path and for development thereabout of a pressurized aerate ring; and,

a stabilizer with means for development of signals responsive to differences in pressures between said ring and said atmosphere and means for rotation of said chassis to axial coincidence with said rotor responsive to said signals.

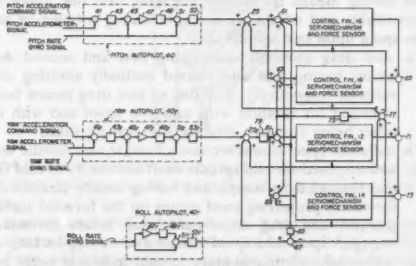
3,946,968
APPARATUS AND METHOD FOR AERODYNAMIC CROSS-COUPLING REDUCTION

David V. Stallard, Wayland, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Aug. 2, 1974, Ser. No. 494,682

Int. Cl.² F42B *15/02*

U.S. Cl. 244—3.21 **2 Claims**



1. In a flight control system for a cruciform missile having opposite pairs of control fins disposed around the body of such missile, the aerodynamic force on each one of such control fins during flight being dependent upon the angle of attack of such missile, the improvement comprising:

a. means for continuously measuring the aerodynamic force on each separate one of the opposite pairs of control fins

of the cruciform missile during flight and for producing a set of analogous electrical signals;

b. computer means, responsive to the set of analogous electrical signals, for producing a first signal corresponding to the roll moment imparted to the cruciform missile by the aerodynamic force on the opposite pairs of control fins and for producing a second output signal corresponding to the sum of the differences in the aerodynamic forces on opposite pairs of control fins; and

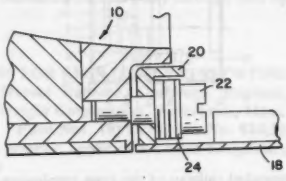
c. amplifier and actuator means, responsive to the first and the second signal out of the computer means, for independently rotating each separate one of the opposite pairs of control fins to null the first and the second signals out of the computer means, thereby to equalize the aerodynamic force on each one of the control fins.

3,946,969

FOLDING TAIL FINS

Ivan L. Marburger, Upland, Calif.; Donald E. Howlett, Reno, Nev., and Lawrence J. Nagel, La Verne, Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 30, 1974, Ser. No. 493,005
Int. Cl.² F42B *13/32*
U.S. Cl. 244—3.28 **2 Claims**



1. A flip out tail assembly for a missile comprising a ring adjacent the rear end of the missile,

bolts mounting said ring for axial movement relative to said missile,

spring means between said ring and the heads of said bolts normally urging said ring forward relative to said missile,

four fins hinged to said ring equidistant therearound,

a shroud assembly fixed to the missile having four longitudinal slots formed therein through which the fins are adapted to project,

lug means on each of said fins adjacent the hinge point,

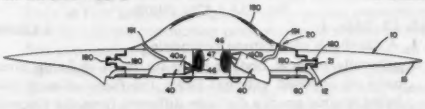
flat surfaces on the rear portion of said missile for cooperation with said lug means whereby forward movement of said ring causes said fins to move outwardly and lock in extended position.

3,946,970

GYROSCOPICALLY STABILIZED, VERTICAL TAKEOFF AND LANDING AIRCRAFT

Ben F. Blankenship, 2681 Leix Way, South San Francisco, Calif. 94080

Filed Dec. 16, 1974, Ser. No. 532,914
Int. Cl.² B64C *29/00*
U.S. Cl. 244—23 C **8 Claims**



1. In a gyroscopically stabilized aircraft having a circular disc of concavo-convex cross-section with a circular opening at its center, a hub disposed in said circular opening, bearing means disposed between said disc and said hub to facilitate relative rotation between said disc and said hub, and thrust means carried by said hub, the improvement comprising:

a plurality of rotatable nozzle means extending through the surface of said disc for inducing rotation of said disc,

diversion means for directing a portion of the exhaust from said thrust means through said nozzle means, and

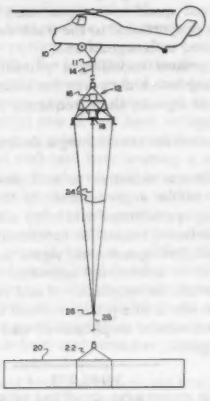
a plurality of opposed pairs of electromagnets mounted in said diversion means and a pair of ferrous lobes carried by said nozzle means whereby said nozzle means is rotated by the selective energizing of a pair of opposed electromagnets which rotates said nozzle means to a position where said ferrous lobes are positioned adjacent the energized pair of electromagnets.

3,946,971

LOAD LIFTING SYSTEM

Russell D. Chadwick, 6125 SW. 152nd Ave., Beaverton, Oreg. 97005

Filed Aug. 9, 1974, Ser. No. 496,106
Int. Cl.² B64D *1/08*
U.S. Cl. 244—137 R **13 Claims**



1. A system for carrying a load from an aircraft, said system comprising:

a platform suspended beneath said aircraft in flight with said aircraft being in weight carrying relation thereto wherein said platform is adapted to be lifted off the ground by said aircraft,

means for connecting a load to said platform,

an engine carried by said platform for lifting at least a major portion of the said load connected to said platform,

and means for controlling said engine to provide immediate regulation of the thrust of said engine for continuously supplying less lift than would lift said engine, said platform and said load independently of said aircraft, so at least part of the load is carried by said aircraft.

12. A method of carrying a suspended load from an aircraft beyond the normally desired load carrying capabilities of said aircraft, in a system including an engine carrying platform, said method comprising:

supporting said engine carrying platform from beneath said aircraft such that said aircraft supports at least the major portion of the weight of the platform and engine,

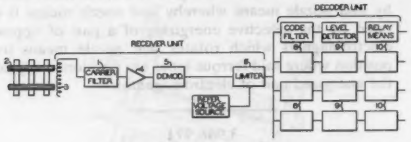
supporting a further load from said platform,

and operating said engine to provide thrust in a substantially vertical direction for lifting at least a major portion of said further load with immediate regulation of the thrust of said engine for continuously supplying less lift than would lift said platform, engine and further load independently of said aircraft, so at least part of the total load is carried by said aircraft.

3,946,972
SIMPLIFIED CAB SIGNAL RECEIVER CIRCUIT

Reed H. Grundy, Murrysville, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed May 8, 1975, Ser. No. 575,630
Int. Cl.² B61L *21/08*
U.S. Cl. 246—34 CT **10 Claims**



1. A cab speed signaling system for a railway train traveling along a section of track rails via which speed code signals are transmitted according to the desired train speed on said track section, said signaling system comprising:

a. receiver means for receiving the transmitted speed code signals and including signal limiter means for modifying the received speed code signal such that the amplitude thereof is proportional to the track current of said transmitted speed code signals and,

b. decoder means including a plurality of different frequency responsive networks for selecting said modified speed code signals, each frequency responsive network comprising:

i. relay means for establishing a desired train speed command;

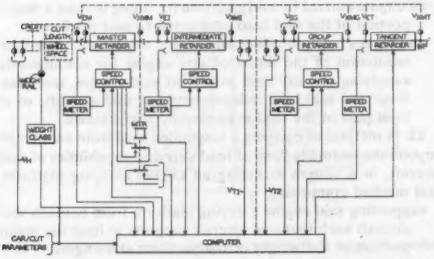
ii. filter means sensitive to said modified speed code signals within a predetermined frequency range for effecting operation of said relay means; and

iii. level detector means for monitoring the amplitude of said modified speed code signal sensed by said filter means so as to interrupt operation of said relay means in the event the amplitude of said received speed code signal is less than a predetermined level corresponding to the minimum amplitude of said transmitted speed code signals.

3,946,973
RETARDER CONTROL SYSTEM FOR AUTOMATIC RAILROAD CLASSIFICATION YARDS

Raymond J. Budway, and George F. McGlumphy, both of Pittsburgh, Pa., assignors to Westinghouse Air Brake Company, Swissvale, Pa.

Filed July 17, 1974, Ser. No. 489,127
Int. Cl.² B61B *1/00*
U.S. Cl. 246—182 BH **20 Claims**



1. A method of controlling the speed of cuts of cars moving in a railroad classification yard along the route between the hump and a selected one of a plurality of storage tracks, comprising the steps of,

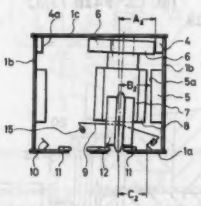
a. controlling the speed of each car cut in a series of successive retarders along the selected route between said hump and the entrance to the selected storage track to obtain a predetermined running time for each cut based on the existing humping rate and measured parameters of each cut, which running time through said series of retarders is substantially the same for each cut following a route to the same group of storage tracks, and

b. further controlling the speed of each cut in a final retarder upon entry into said selected track to assure that it moves to coupling with with previously stored cars at a coupling speed within preselected safe limits.

3,946,974
RAILWAY SWITCH CONSTRUCTION FOR SUSPENDED RAILROAD USING TWO-RUNWAY-RAIL SUSPENSION RAILS

Christian Stiefel, Aachen, and Fritz Frederich, Krefeld, both of Germany, assignors to Waggonfabrik Uerdingen A.G., Krefeld, Germany

Filed July 1, 1975, Ser. No. 592,304
Claims priority, application Germany, July 3, 1974, 2431867
Int. Cl.² E01B *7/00*
U.S. Cl. 246—415 R **13 Claims**



1. In a suspended railway of the type employing a suspension rail provided with two runway rails upon which respectively ride the first and second traveller wheel sections of a traveller from which a railway car, or the like, is suspended, a railway switch therefor, the switch having a stem section and two branch sections, each of the two runway rails of the stem section being also the outer runway rail of a respective one of the two branch sections; each of the two branch sections furthermore having a respective inner runway rail, the inner runway rails of the two branch sections defining together with the outer runway rails a switch gap over which one of the traveller wheel sections crosses unsupported as the traveller crosses the switch gap so that in crossing the switch gap the traveller exhibits a tendency to tilt in a first direction towards the side of the unsupported traveller wheel section; and means for positively causing the traveller to tilt in the opposite second direction when crossing the switch gap to assure that at the completion of the crossing of the switch gap the unsupported traveller wheel section will not be below the level of the runway rail onto which it is about to come into contact.

3,946,975
CLIMBER'S CHOCKSTONE

Thomas G. Lyman, Jr., The White Mountain School, Seven Springs, Littleton, N.H. 03561

Filed Apr. 9, 1975, Ser. No. 566,207
Int. Cl.² A47G *29/00*
U.S. Cl. 248—1 **6 Claims**

1. A climber's chockstone comprising:

a generally cubical body having six faces defining three pairs of opposed external faces, the faces of each pair being spaced apart a distance different from the distance between the faces of the other pairs with the faces of each pair converging in one direction whereby said body defines three wedges of different widths;

a cavity in said body and having a continuous opening extending through at least one face of one pair and

through a major portion of an adjacent face between the faces of the other pair;

a support member extending across said cavity within said body generally normal to said other pair of faces; and

a loop of sling rope extending around said support member and outwardly of said body through said opening.

3,946,976

MEANS FOR RESILIENTLY SUPPORTING A BODY

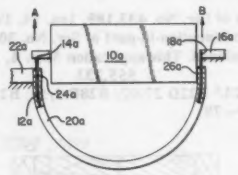
Michael Harold Radford, Guildford, England, assignor to Barry Wright Corporation, Watertown, Mass.

Filed Nov. 18, 1974, Ser. No. 524,357

Claims priority, application United Kingdom, June 5, 1973, 26876/73

Int. Cl.² F16F *7/00, 9/346;* **F16D** *63/00;* **F16F** *13/00*

U.S. Cl. 248—18 **16 Claims**



1. A stabilizing system comprising:

a body;

a fixed mounting support;

a sheath having first and second connecting portions; and

a cable slidably disposed within said sheath and having first and second connecting portions corresponding in relative position to the first and second connecting portions of said sheath;

the first connecting portion of said sheath and the second connecting portion of said cable being connected to said body at first and second spaced apart points respectively and the second connecting portion of said sheath and the first connecting portions of said cable being connected to said support at third and fourth spaced apart points respectively so that said connecting portions of said sheath and cable are substantially parallel and lie substantially within a predetermined plane and displacement of said body at one of said first or second points within said plane will result in a corresponding displacement of said body at the other of said first and second points.

3,946,977

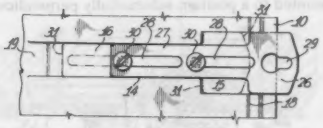
TELEPHONE UNIT WITH RETRACTABLE MOUNTING BRACKET

Gerd Kuhfus, London, Canada, assignor to Northern Electric Company, Limited, Montreal, Canada

Filed Nov. 20, 1974, Ser. No. 525,645

Int. Cl.² A47G *29/00*

U.S. Cl. 248—126 **1 Claim**



1. A telephone unit comprising:

a base housing for resting on a horizontal surface, said base housing including a base surface and a peripherally extending wall, said base surface having a forward end and a rearward end and a central axis extending from said forward end to said rearward end;

a recess in said base surface, said recess of Tee formation having a stem portion and a cross-bar portion, the cross-bar portion of the Tee formation extending to said peripheral wall at said rearward end of said base surface and said stem portion extending from said cross-bar portion along said central axis of said base surface;

two spaced bosses in said recess on said central axis, said bosses integral with said base housing, a surface of each boss substantially level with said base surface;

a Tee shaped bracket in said recess, said bracket including a head portion and a stem portion, said head portion adapted to fit in said cross-bar portion of said recess, said stem portion of said bracket a sliding fit in said stem portion of said recess, said bracket slidable along said central axis from a retracted position wherein said head portion is entirely in said cross-bar portion of said recess to an extended position wherein a major part of said head portion extends from said cross-bar portion of said recess beyond said peripheral wall;

an aperture in said head portion of said bracket, said aperture of a keyhole form including a small diameter portion adjacent an outer edge of said head portion and a large diameter portion toward said stem portion, said aperture exposed when said bracket is in an extended position;

two elongated slots formed in said stem portion of said bracket, said slots extending along the longitudinal axis of the stem portion and positioned over said bosses;

retaining means in said bosses extending through said slots and including head portions engaging said stem portion of said bracket to retain said bracket in said recess, and

an aperture in said base housing at the bottom periphery edge of said base surface for the entry of a telephone cord;

the arrangement such that on extending said bracket to said extended position to expose said aperture of keyhole form in said head portion of said bracket, the telephone unit can be mounted on a vertical surface by engagement of said aperture of keyhole form with mounting means on said vertical surface.

3,946,978

CURTAIN ROD MOUNTING DEVICE

William D. Evans, Plains, Mont., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed May 27, 1975, Ser. No. 581,354

Int. Cl.² A47H *1/122*

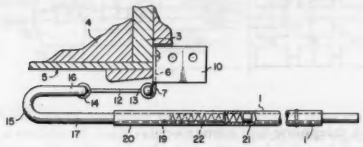
U.S. Cl. 248—264 **3 Claims**

1. A curtain rod mounting device for affixing a curtain rod to an inside surface of a window casing mounted in a wall

having a surface and positioning the rod above the window casing, said mounting device comprising

a window plate member affixed to an inside surface of a window casing;

an elevating plate member having a lower end hingedly affixed to the window plate member and extending upward from the window plate member to an area above the window casing for rotation from a position closely adjacent the surface of a wall in which the window casing is mounted to a position substantially perpendicular to said



surface, said elevating plate member having an upper end; and

a rod connecting member comprising a rod of substantially U-shape having a pair of legs, a first free end extending at substantially right angles to the plane of the legs pivotally mounted on the upper end of the elevating plate member in a manner whereby the legs are movable in a plane substantially perpendicular to the surface of the wall, and a second free end in the plane of the legs for accommodating a substantially tubular curtain rod.

3,946,979

ADJUSTABLE SUSPENSION FOR ATTACHING PIECES OF FURNITURE TO A WALL

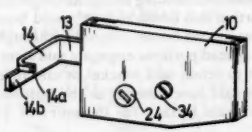
Horst Ehlebracht, and Albert Philipp, both of Herford, Germany, assignors to Firma Richard Heinze GmbH & Co. KG, Herford, Germany

Filed July 21, 1975, Ser. No. 597,741

Claims priority, application Germany, July 25, 1974, 2435842

Int. Cl.² A47B *67/02, 43/00;* **A47F** *5/08, 3/00*

U.S. Cl. 248—274 **15 Claims**



1. Adjustable suspension for attaching pieces of furniture, such as wall cupboards, to a wall, said suspension having a housing adapted to be secured to the inside of the furniture side-wall, a supporting arm adjustable within the housing for height and depth, a rotatable cam, having a rough surface, located in the housing below the supporting arm, and an opposing area, having a rough surface, provided in the housing above the supporting arm, the length of the supporting arm within the housing being provided with rough upper and lower securing areas along its edges, the lower securing area coacting with the cam for adjustment of height and depth, and the upper securing area coacting with said opposing area to arrest the supporting arm in the adjusted position.

3,946,980

GUITAR MUSIC CARD CLIP

David Tamarkin, 10 Brighton Road, West Hartford, Conn. 06117

Filed Jan. 23, 1975, Ser. No. 543,252

Int. Cl.² G10G *5/00*

U.S. Cl. 248—443 **10 Claims**

1. A music holder for a stringed instrument, the instrument having a sounding board with a port therein, said holder comprising:

an elongated resilient member;

hook means affixed to said elongated resilient member at the opposite ends thereof, said hook means each having an arcuate instrument engaging portion designed to engage the sounding board of an instrument at the edge of the sound port therein; and

a spring clip mounted on said elongated resilient member, said clip being capable of movement along said member, said clip having normally closed jaws for the engagement of music in sheet form to hold the music away from the instrument, said jaws establishing a first linear region of contact with the music sheet and the portion of said resilient member disposed within said clip establishing a second linear region of contact with the music sheet, said second region of contact being displaced from said first region of contact.

3,946,981

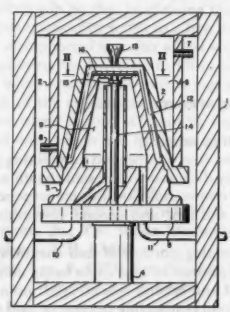
MOLDING APPARATUS

Alan I. W. Frank, c/o Alan I. W. Frank Corporation, Exton, Pa. 19341

Continuation of Ser. No. 433,189, Jan. 14, 1974, abandoned, which is a continuation-in-part of Ser. No. 308,194, Nov. 10, 1972, abandoned. This application Mar. 4, 1975, Ser. No. 555,233

Int. Cl.² B22D *27/02;* **B28B** *1/50;* **B29C** *3/00*

U.S. Cl. 249—79 **3 Claims**



1. Molding apparatus for forming a thin walled article such as a cup or similar vessel from heat softenable, expandable, polymeric particular material, said apparatus including mold parts comprised of a mold cavity and a complementary shaped mold core, which together form an article defining molding space therebetween for receiving the heat softenable particulate material and expanding and uniting said particulate mate-

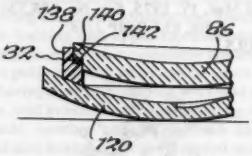
rial into a final product in an inverted position, said parts being formed of heat conducting material; means for heating said mold parts, said means for heating including steam chambers within said mold parts for receiving steam therein and means for admitting only dry steam into the molding space adjacent that portion of the molding space where the bottom of the article is formed, said means including a valve housed within and positioned at the top of said core, a valve actuator member operable to open and close said valve and duct means located only along the top of said core, said duct means extending radially and outwardly through the heat conducting material of the core along the top thereof from said valve to the molding space, said duct means comprising a plurality of ducts each having a cross sectional area of not more than 0.001 square inches, said valve means, when open, placing said duct means in communication with the steam chamber in said core whereby, as said steam is passing through said duct means, moisture entrained therein is vaporized during passage through said duct and said steam enters the molding space as dry steam.

3,946,982

ADJUSTABLE MOLD FOR DIRECT CASTING OF PLASTIC MULTIFOCAL LENSES

Tracy H. Calkins, and Frank E. Duckwall, both of Tampa, Fla., assignors to Textron, Inc., Tampa, Fla.

Filed Sept. 3, 1974, Ser. No. 502,562
Int. Cl.² B29D *11/00*
U.S. Cl. 249—102 **26 Claims**



1. Apparatus for casting a multifocal plastic lens comprising

a power mold adapted to form a first surface of said lens,

a multifocal mold adapted to form a second opposing surface of said lens, said multifocal mold being shaped to form a reading segment in said second opposing surface at a predetermined distance from the geometric center of said multifocal mold,

a gasket for supporting said power and multifocal molds in spaced apart relationship whereby a lens may be formed having a distance field of a first diopter power and a reading segment of a second diopter power and whereby said distance field has an optical center,

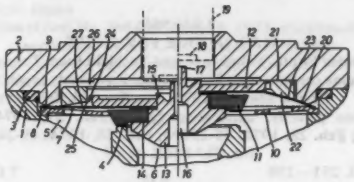
and means for adjusting the position of said reading segment relative to said optical center.

3,946,983

VALVE WITH A CLOSING MEMBER ACTUATED BY WAY OF A DIAPHRAGM

Lorenz Asmus Engberg, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Aug. 7, 1974, Ser. No. 495,385
Int. Cl.² F16K *31/385*
U.S. Cl. 251—61.2 **2 Claims**



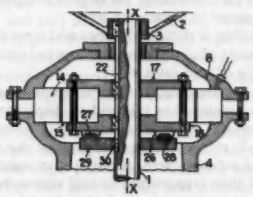
1. A valve unit comprising a valve housing having internal wall means defining an inlet chamber, a discharge conduit in said inlet chamber having a valve seat, a valve assembly including a support plate and a closure member cooperable with said valve seat, said valve assembly having a central orifice, a diaphragm clamped between said closure member and said support plate, said diaphragm having the outer rim thereof floatingly held by said housing, an axially movable ring between said diaphragm and said housing internal wall means, said ring and said internal wall means having generally conical surfaces to which said diaphragm conforms when said valve assembly is in an open position, said conical surfaces being in adjacent and in smoothly merging relation to each other when said valve assembly is in an open position, said ring and said support plate having mutually engageable flange means whereby said ring is forced to trail the movement of said support plate when said valve assembly moves to an open position.

3,946,984

MOTOR-DRIVEN CONTROL DEVICE FOR A VALVE ROD

Jean Georges Sutter, Villers-les-Nancy, France, assignor to Pont-a-Mousson S.A., Pont-a-Mousson, France

Filed June 15, 1973, Ser. No. 370,261
Claims priority, application France, June 19, 1972, 72.22078; Nov. 8, 1072, 72.39455; Apr. 25, 1973, 73.14916
Int. Cl.² F16K *31/05*
U.S. Cl. 251—130 **10 Claims**



1. In a valve structure having a valve closure member, a frame attached to a body of the valve structure, an actuating member rotatable relative to the frame and combined with the valve closure member to shift the closure member between valve opening and valve closing positions upon rotation of the actuating member; wherein the improvement comprising for rotating the actuating member

a. a variable reluctance motor having a stator fixed to the frame and an annular rotor rotatable within the stator;

b. means connecting the rotor to the actuating member such that the rotor is coaxial with the actuating member and rotates therewith;

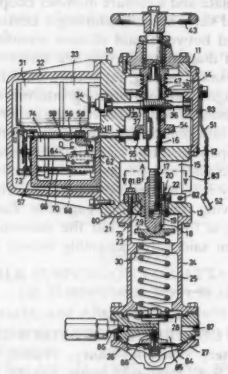
c. the rotor defining with the actuating member an annular space in which space said connecting means extend;
d. said rotor being combined with two annular support plates coaxial with and slidably keyed to the actuating member, the plates extending radially across said annular space and being in clamping engagement with the rotor, said connecting means connecting the support plates to the actuating member.

3,946,985

VALVE DEVICE FOR GASES

Tomomitsu Fujita, Yokohama, and Yoshiaki Imai, Tokyo, both of Japan, assignors to Tokico Ltd., Kawasaki, Japan

Filed Feb. 26, 1975, Ser. No. 553,307
Claims priority, application Japan, Feb. 28, 1974, 49-23989; Feb. 28, 1974, 49-23990; Feb. 28, 1974, 49-24497
Int. Cl.² F16K *31/05*
U.S. Cl. 251—130 **7 Claims**



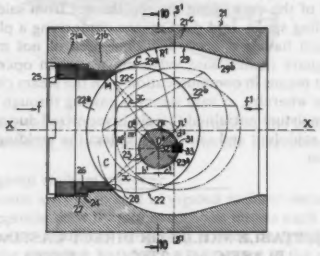
1. A valve device for gases comprising:
a pilot valve for controlling the degree of opening of a main valve disposed in a gas pipe line;
means including a sliding member and operated by sliding displacement of said sliding member to control the degree of opening of said pilot valve;
a main rotating shaft adapted to be rotated thereby to drive the sliding member in said sliding displacement;
an electric motor for rotating said main rotating shaft;
a screw shaft rotated by the rotation of the main rotating shaft, said rotation being multiplied in number of revolutions and then transmitted to said screw shaft;
a moving structure screw meshed with said screw shaft and thereby driven in translational movement by the rotation of the screw shaft; and
limit switch means disposed at limit positions defining the range of movement of said moving structure corresponding to limits defining the range of sliding movement of at least the sliding member and opened when the moving structure reaches either of said limit positions thereby to cut off power supply to said electric motor,
said range of movement of the moving structure being set at a greater value than a range of sliding movement of said sliding member, both movements being due to the rotation of the main rotating shaft.

3,946,986

FLOW REGULATING VALVE

Jean Georges Sutter, Villers-Les-Nancy, and Jean Pierre Depoisson, Pont-A-Mousson, both of France, assignors to Pont-A-Mousson S. A., Nancy, France

Filed June 12, 1974, Ser. No. 478,496
Claims priority, application France, June 15, 1973, 73.21849; May 27, 1974, 74.18258
Int. Cl.² F16K *31/528*
U.S. Cl. 251—298 **20 Claims**



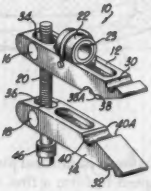
1. In a flow regulating valve of the type comprising a body defining an inner chamber of revolution having an axis of revolution and provided with an inner annular seat having a general plane which is perpendicular to said axis and a closure member which has a substantially spherical valving surface and is movable in the body by actuating means between a valve closing position in which the closure member cooperates with the seat and at least one valve opening position, the following features: the closure member has the shape of two spherical domes, united on circular peripheries thereof in a plane which is parallel to the general plane of the seat in the valve closing position of the closure member, and the actuating means comprises an element mounted in the body to rotate about a second axis which extends through a first one of said domes and is perpendicular to, but offset from, said axis of revolution, said element being rigidly connected to rotate with said first one of said domes.

3,946,987

COIL SPRING SPREADER

William E. Shultz, 239 N. Main St., Lombard, Ill. 60148

Filed Mar. 17, 1975, Ser. No. 558,736
Int. Cl.² B60P *1/48*
U.S. Cl. 254—10.5 **19 Claims**



1. Apparatus for applying force to a biased member comprising
a first elongated leg member having a biased member engaging end and a pivot end;
a second elongated leg member having a biased member engaging end and a pivot end and interconnected to said first elongated leg member; means for interconnecting said first elongated leg member to said second elongated leg member including means defining a slot in each of said leg members, a pivot means in each of said slots and

actuating means interconnecting said pivot means, said leg members being independently pivotable about said interconnecting means;

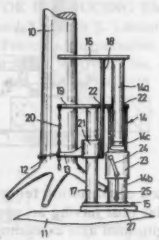
a fulcrum means disposed in operative condition between said actuating means and said biased member engaging ends of said leg members and separable from at least one of said leg members.

3,946,988

TREE AND THE LIKE OBSTACLE EXTRACTOR

Jakob Kehren, Ziegeleiweg 8, 4990 Lubbeck i. Westf., Germany

Filed June 5, 1974, Ser. No. 476,533
Claims priority, application Austria, June 8, 1973, 5109/73
Int. Cl.² E21B *19/00*
U.S. Cl. 254—30 **5 Claims**



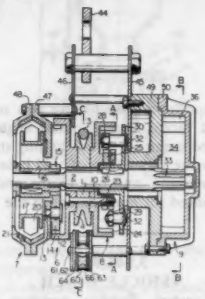
1. A device for pulling trees, bushes, masts, poles or like obstacles out of the ground or a similar base, comprising lifting means having a lower stationary part and an upper movable part adapted to move upwardly with respect to said stationary part when carrying out a lifting stroke, said lifting means being adapted to be situated on the ground or similar base adjacent the obstacle, movable, releasable holding means operatively connected with said movable part of said lifting means for movement therewith and for holding the obstacle when said movable releasable holding means is in a holding position while releasing the obstacle when said movable releasable holding means is in a release position, and stationary releasable holding means operatively connected with said stationary part of said lifting means to remain stationary therewith and also having a holding position for holding the obstacle and a release position for releasing the obstacle, said lifting means including a cylinder forming said lower stationary part and a piston forming said upper movable part and having an upper free end, said movable releasable holding means including an upper guide member fixed to said upper free end of said piston and having a portion adapted to extend partially around the obstacle, said movable releasable holding means including a lower guide member situated beneath said upper guide member and also having a portion adapted to extend partially around the obstacle, and one of said guide members having an elongated flexible element adapted to extend around the remainder of the obstacle and be fixed with said one guide member when said movable releasable holding means is in its holding position while said flexible element can hang freely from said one guide member when said movable releasable holding means is in its release position, said stationary releasable holding means including a third guide member situated between said upper and lower guide members and fixed to said cylinder and having a portion also adapted to extend partially around said obstacle while carrying a flexible element adapted to extend around the remainder of the obstacle and be fixed with said guide member when said stationary releasable holding means is in its holding position while the latter flexible element can hang freely from said third guide member when said stationary releasable holding means is in its release position, said third guide member being formed with an opening and said movable releasable holding means including an elongated traction rod extending between and fixed to said upper and lower guide members and extending through said opening.

3,946,989

SLOW DESCENDER INCLUDING FLUID AND MECHANICAL BRAKING DEVICES

Masao Tsuda, No. 12-10, Chuo Honcho 1-chome, Adachi, Tokyo, Japan

Division of Ser. No. 360,067, May 14, 1973, abandoned. This application Dec. 17, 1974, Ser. No. 533,686
Claims priority, application Japan, May 22, 1972, 47-49935; Dec. 23, 1972, 48-2264; Dec. 23, 1972, 48-2265; Jan. 18, 1973, 48-7379; Feb. 8, 1973, 48-15150
Int. Cl.² B66D *5/04*
U.S. Cl. 254—157 **6 Claims**



1. In a slow descender of the type including a frame; means for connecting said frame to a building or the like; a rope pulley, rotatably mounted on a shaft supported on said frame, and adapted to guide around a portion of the periphery thereof a load supporting rope; and a braking apparatus for restricting the rotational speed of said rope pulley; the improvement wherein said braking apparatus comprises:

a mechanical braking means positioned on a first axial side of said rope pulley and comprising:

a non-rotatable lining mounted on said frame and having a V-shaped friction braking surface;

a rotatable centrifugal braking device including rotatable weights urgable by centrifugal force upon rotation into contact with said friction braking surface; and

a mechanical accelerating device connecting said rope pulley and said centrifugal braking device and including a ring gear connected to said rope pulley to rotate therewith, plural intermediate planetary gears rotatably positioned on respective stationary shafts and meshing with said ring gear, and a sun gear meshing with each of said planetary gears and connected to said centrifugal braking device for rotating said weights; and

an oil-hydraulic braking means positioned on a second axial side of said rope pulley and including an oil chamber sealed from the atmosphere, and a rotatable element drivably connected to said rope pulley and positioned in said oil chamber.

3,946,990

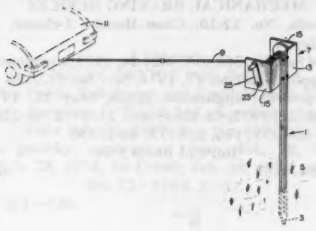
PORTABLE WINCH DEVICE

Troy Tanner, 3104 Emogene St., Mobile, Ala. 36606

Filed Oct. 9, 1974, Ser. No. 513,220
Int. Cl.² A63B *61/04*
U.S. Cl. 254—164 **3 Claims**

1. An apparatus for moving objects, including, in combination, an elongated fixed member, a winch mounted on said fixed member adjacent one end thereof, a cable operatively connected to said winch and coilable thereon upon operation

of the winch, said cable being removably affixed to an object to be moved and said fixed member being provided with means causing said fixed member to be rigid and immovably fixed in a desired position, wherein said means is provided on and extends along a major portion of the length of said fixed

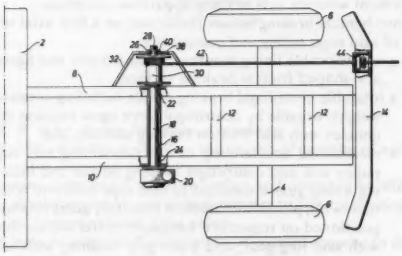


member and comprises a base having two substantially flat faces, one of said faces being in fixed engagement with a surface of said fixed member, an upstanding strengthening rib being provided on the other face of said base and extending longitudinally therealong, and one of the ends of said fixed member being pointed for embedment in the ground.

3,946,991
VEHICLE WINCH

Erik Eriksson, Vansbro, Sweden, assignor to Sepson AB, Vansbro, Sweden

Filed July 12, 1974, Ser. No. 488,211
Int. Cl.² B66D *3/00*
U.S. Cl. 254—166 **7 Claims**



1. A combination of a vehicle having a frame with a pair of side beams and a vehicle winch comprising a cable drum and a winch operating device arranged in operating engagement with said cable drum via a transmission shaft which extends substantially perpendicularly to the longitudinal axis of the vehicle, and bearings positioned in said side beams operatively engaging said transmission shaft, the cable drum and the winch operating device being arranged externally of different ones of said side beams and at least one of the cable drum and the winch operating device being detachably mounted to said shaft,

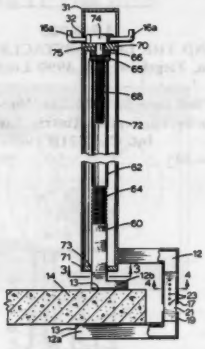
a tube or a transverse beam at least partially encircles the shaft between the side beams, and

wherein said tube or said transverse beam comprises one of the original vehicle frame transverse beams.

3,946,992
CONSTRUCTION FENCE POST

Murray A. Elias, Islington, Canada, assignor to Dell Holdings Limited, Toronto, Canada

Filed Feb. 28, 1975, Ser. No. 554,067
Int. Cl.² E04H *17/14*
U.S. Cl. 256—68 **9 Claims**



1. An end mounted construction fence post comprising

a. a hollow tubular post having an upper end and a lower end and a longitudinal axis extending therebetween,

b. a C-shaped bracket mounted at the lower end of said post and opening laterally of said axis of said post, said C-shaped bracket having an arm spaced downwardly from and underlying the lower end of said post,

c. A shank extending into said hollow tubular post and having a lower end projecting outwardly from the lower end of said tubular post towards said arm,

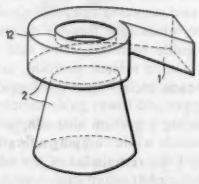
d. drive means at the upper end of said post for driving said shank towards and away from said arm of said C-shaped bracket whereby said shank may cooperate with said arm to releasably clamp said post to a structure disposed therebetween,

e. said shank being resiliently longitudinally compressible whereby a clamping force is maintained between said shank and said arm when the proportions of said structure which is disposed therebetween vary due to temperature variations or the like.

3,946,993
SUCTION-MIXING HEAD PROVIDED WITH SWIRL CHAMBER

András Morlin, Budapest, Hungary, assignor to "Fütöber" Épületgépészeti Termékeket Gyarto Vallalat, Budapest, Hungary

Filed Sept. 10, 1974, Ser. No. 504,694
Int. Cl.² B01F *5/00*
U.S. Cl. 259—4 R **3 Claims**



1. In an apparatus in which a primary fluid is admixed with a secondary fluid and the resulting mixture is discharged and wherein the apparatus comprises a source of said primary fluid

under pressure and a plenum containing the secondary fluid, the improvement which comprises:

a suction mixing head comprising a housing defining a swirl chamber having an axis, said chamber having an inlet end formed with an inlet communicating with said plenum and an outlet end spaced from said inlet end and formed with an outlet, said chamber being defined by at least one wall of said housing diverging from said inlet to said outlet; and

a fitting opening tangentially into said chamber proximal to said inlet and connected to said source whereby the primary fluid fed under pressure tangentially into said chamber swirls along said wall to generate suction along said axis and suck secondary fluid from said plenum through said inlet into said chamber.

3,946,994

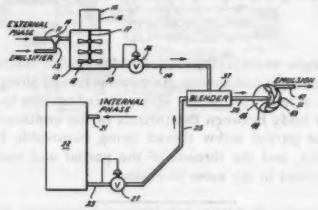
SYSTEM FOR PRODUCING EMULSIONS

Richard E. Mertz, and Kenneth J. Lissant, both of St. Louis, Mo., assignors to Petrolite Corporation

Filed Apr. 10, 1974, Ser. No. 459,760

Int. Cl.² B01F *7/00*

U.S. Cl. 259—7 **1 Claim**



1. A system for producing at a selected rate a stable, highly viscous emulsion with an internal phase content of above about 75% by volume within an immiscible external phase comprising:

a. supply means providing individual streams of an inverter phase formed of water-in-oil emulsifier and a hydrocarbon phase, and a water phase;

b. first and second flow rate controller means each having a regulating valve automatically adjusted by pressure differential across an orifice in each stream for precisely regulating responsively to pressure changes in said supply means the flow rates of separate streams of the water phase and the inverter phase in a preselected ratio in the range of between 95 to 5, and 75 to 25% by volume irrespective of the pressure conditions within said system above a certain minimum pressure change;

c. mixing means receiving the separate streams of the water phase and the inverter phase and mixing said streams under the preselected ratio condition wherein the water phase is distributed loosely in the inverter phase, thereby forming a composition with the desired ratio of water phase, emulsifier and hydrocarbon phase of the desired emulsion;

d. pumping means;

e. means for passing said composition of water phase and inverter phase into said pumping means for moving therethrough said composition at the selected rate;

f. said pumping means providing continous shear at rates between about 500 and 10,000 reciprocal seconds sufficient to reduce the effective viscosity of said composition near to that of the inverter phase but below the inherent shear stability point of the desired emulsion; said pumping means retaining less than 1% by volume of said emulsion relative to the volume per minute of said composition being moved; and

g. outlet means for removing the resultant emulsion from said pumping means to a subsequent utilization.

3,946,995

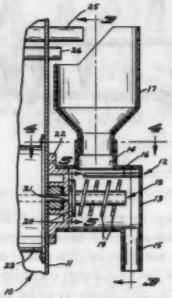
INTER ARC INGREDIENT MIXER

Warren W. Anderson, 7208 Newton Ave. South, Minneapolis, Minn. 55423

Filed July 26, 1973, Ser. No. 382,880

Int. Cl.² B01F *7/10*

U.S. Cl. 259—9 **10 Claims**



1. In ingredient mixers of the class above described, the combinaton, comprising;

a. a cylindrical chamber having a generally horizontal axis, an inlet positioned at the approximate top midway between the end walls thereof, an outlet adjacent one of the end walls, and a shaft disposed coaxially of said cylindrical chamber extending into the other end wall of said chamber;

b. a whipper disposed on said shaft for rotation therewith, said whipper including a plurality of axially spaced apart blades of segmented configuration, said blades being inclined with respect to the longitudinal axis of said shaft and parallel with one another and adapted to be rotated in a direction which causes ingredients from said inlet to be impelled circumferentially in the direction of rotation of said shaft and to direct portions of the ingredients toward said other end of said cylindrical chamber.

3,946,996

MIXING AND GRANULATING APPARATUS

Gerhard Gergely, Vienna, Austria, assignor to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany

Filed Apr. 17, 1973, Ser. No. 351,864

Claims priority, application Germany, Apr. 18, 1972, 2218729

Int. Cl.² B01F *7/08, 15/02*

U.S. Cl. 259—10 **8 Claims**

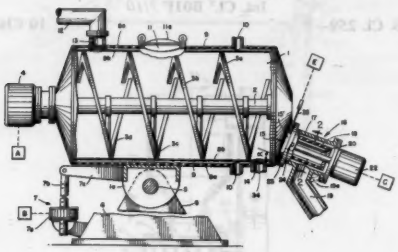
1. Apparatus for mixing and granulating a finely divided solid material which comprises:

a closed elongated mixing drum having a tiltable axis of rotation and separate means for periodic introduction and removal of said solid material being treated; including a drum discharge opening arranged approximately tangential to the lowermost inner wall line extending axially of the drum and a tubular discharge housing fastened over said discharge opening externally of the drum and in an inclined position with reference to the drum axis, a cylindrical screening communicating with said discharge opening and means being mounted concentrically within said tubular discharge housing above a discharge outlet in said housing and an independently rotatable discharging means being mounted inside of said screen means to press solid material flowing through said

discharge opening outwardly through said screen means and said discharge outlet;

a rotatably driven shaft mounted along the drum axis with means to rotatably drive said shaft in a clockwise or a counterclockwise direction;

conveyance means including at least one helical blade mounted on said shaft for mixing and stirring said finely divided solid material and extending over the length of



the drum and up to the drum wall so as to reversibly convey said solid material in a direction parallel to the drum axis upon rotation of the shaft; and

a rotatable support for said drum including means to adjustably tilt and lock said drum in either positions above or below a normally horizontal position of the drum axis such that the force of gravity may work either with or against the conveying action of said helical blade.

3,946,997

AGITATOR FOR NONHOMOGENEOUS, LIQUID MATERIALS IN A TANK

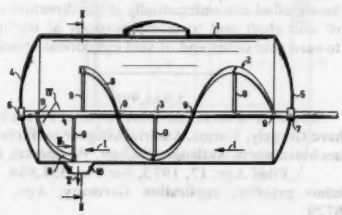
Hans Grenzebach, Am Neuberg 11, 878 Gemunden (Main), Germany

Filed Nov. 23, 1973, Ser. No. 418,598

Claims priority, application Germany, Nov. 25, 1972, 2257956

Int. Cl.² B01F *7/08*

U.S. Cl. 259—45 **7 Claims**



1. An agitator for a normally nonhomogeneous mixture of must and floating mash, comprising:

an elongated tank means of circular cross section for holding said nonhomogeneous mixture having a central axis;

a single rotatable spiral-shaped blade thin in axial dimension and wide in radial dimension in said tank means, said blade being spaced from the axis of rotation therefor and extending between the opposite ends thereof, the external diameter of said blade being less than the inner diameter of said tank means and the axis of rotation of said blade being offset from and parallel to the central axis of said tank means so that a portion of said blade, in its lowermost position relative to the bottom internal wall surface of said tank, is radially spaced from said bottom internal wall surface a distance which is smaller than the radial width of said blade and, in its uppermost position, is radially spaced from the upper internal wall surface of said tank means a distance which is substantially greater than the radial width of said blade; and

means defining an outlet opening in said bottom wall of said tank means, said blade, during rotation, mixing said must and said floating mash so that said mash and said must are nearly homogeneous within a theoretical cylinder defined by said spiral-shaped blade and simultaneously conveying said homogeneous mixture toward said outlet opening.

3,946,998

SINGLE WORM EXTRUDER

Hans George Ludwig Menges, Lavrensberg-by-Aachen; Engelbert Gerhard Harms, Vaalserquartier by Aachen, and Josef Peter Lehnen, Verlautenheide-by-Aachen, all of Germany, assignors to Uniroyal Aktiengesellschaft, Aachen-Rothe-Erde, Germany

Filed June 18, 1971, Ser. No. 154,490

Claims priority, application Germany, June 30, 1970, 2032197

Int. Cl.² B29B *1/06*

U.S. Cl. 259—191 **14 Claims**

1. A single worm extruder screw for rubber mixtures and the like having a continuous main screw thread along a screw body and at least one partial screw thread section located on the screw body between the threads of the continuous main screw, the partial screw thread being removable from the screw body, and the threads of the partial and main screw being oriented in the same direction.

3,946,999

APPARATUS FOR PLASTICIZING AND INJECTING MOULDABLE SYNTHETIC MATERIAL

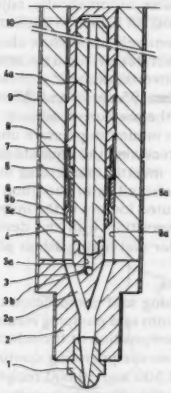
Thomas Nussbaumer, Zug, Switzerland, assignor to Patent and Inventions Ltd., Switzerland

Filed Dec. 30, 1974, Ser. No. 537,324

Claims priority, application France, Jan. 4, 1974, 74.224

Int. Cl.² B29B *1/06*

U.S. Cl. 259—191 **6 Claims**



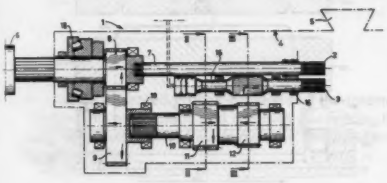
1. Apparatus for plasticizing and injecting moldable synthetic material comprising, a cylindrical member having an axial bore of circular cross-section therein into which said material is introducible; nozzle means firmly secured to one end portion of said cylindrical member and communicting

with said cylindrical bore; a worm shaft mouned in said bore to be axially and rotatably displaceable relative to said cylindrical member and provided with an opening of circular cross-section extending longitudinally of said shaft from an end face thereof facing said nozzle means; and a closure body mounted to be stationary within and relative to said cylindrical member and to project into the opening of said worm shaft, said closure body providing a seal between the opening of said worm shaft and said axial bore.

3,947,000
EXTRUDER DRIVE

Warner Jan de Putter, Hardenberg, Netherlands, assignor to Wavin B.V., Zwolle, Netherlands

Filed Mar. 6, 1974, Ser. No. 448,482
Claims priority, application Netherlands, Mar. 19, 1973, 7303840
Int. Cl.² B29B *1/10*
U.S. Cl. 259—192 **5 Claims**



1. In an extruder for synthetic materials comprising an extruder housing having an extruder inlet, two mixing and conveying worms each mounted on a respective shaft, means for directly driving one of the worms and transmission means for driving the second worm; the improvement comprising a first auxiliary shaft associated with said transmission means and disposed substantially parallel to said worm shafts, a first gear wheel mounted on said first auxiliary shaft having gear teeth inclined to the axis thereof which are drivingly connected with a pinion carried by said second worm shaft, a second gear wheel mounted on said first auxiliary shaft having gear teeth inclined to the axis therof at an angle convergingly disposed with respect to the teeth of said first gear wheel and which are drivingly connected with said pinion at a point generally diametrically opposite from the point at which said first gear wheel is drivingly connected thereto, and wherein said first auxiliary shaft is axially slidably mounted whereby it is free to adjust itself axially with respect to said second worm shaft thereby facilitating a substantial canceling of opposite bending loads transmitted to said second worm shaft by said gear wheels.

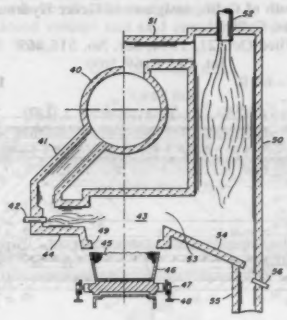
3,947,001
COMBUSTION SYSTEM

Guy P. Leighton, Monroeville, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.

Filed Jan. 13, 1975, Ser. No. 540,567
Int. Cl.² F27B *9/06*
U.S. Cl. 266—20 **9 Claims**

1. In a pelletizing apparatus of the travelling grate type for heat indurating compacted ore bodies, comprising a drying zone, a firing zone and a cooling zone, an improved combustion means comprising:

at least one vertically extending chamber located adjacent the firing zone and to one side of the travelling grate, said chamber communicating proximate its lower end with the firing zone, fuel injection means vertically oriented in the upper end of said chamber and means for introducing

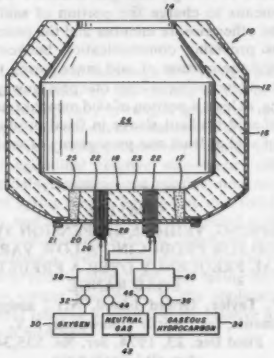


recuperated air from the cooling zone into the upper end of said chamber.

3,947,002
METHOD OF BURNING-IN LINING IN BOTTOM BLOWN STEELMAKING FURNACE

Louis W. Frech, Chesterton, Ind.; David H. Hubble, Franklin Township, Westmoreland County, Pa., and Lewis J. Zook, Merrillville, Ind., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed July 30, 1975, Ser. No. 600,232
Int. Cl.² C21C *5/44*
U.S. Cl. 266—43 **7 Claims**



1. A method of burning-in refractory material in a bottom-blown oxygen steelmaking converter including tuyere means installed in the bottom of said converter, said tuyere means defining at least one passage for passing oxygen to the interior of said converter and another passage for passing a gaseous hydrocarbon thereto, comprising the steps of:

a. passing oxygen and gaseous hydrocarbon for combustion within the interior of said converter through each of said passages respectively;

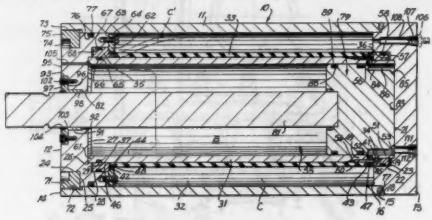
b. regulating the flow of said oxygen and gaseous hydrocarbon to control the rate of heating said refractory; and

c. simultaneously passing a neutral gas in mixed relation with at least one of said oxygen and gaseous hydrocarbon in amounts to create a total fluid flow through said tuyere passages of sufficient magnitude to prevent the retrograde entry of foreign material thereinto.

3,947,003
HYDROPNEUMATIC SPRING

Alphonse A. Jacobellis, Woodland Hills, and Abduz Zahid, Los Angeles, both of Calif., assignors to Greer Hydraulics, Inc., Los Angeles, Calif.

Filed Oct. 21, 1974, Ser. No. 516,469
Int. Cl.² F16F 5/00
U.S. Cl. 267—64 R **12 Claims**

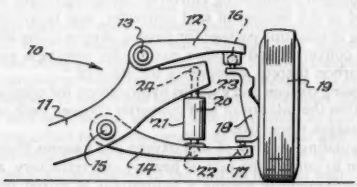


1. A device of the character described comprising an outer cylindrical casing having a closure member at each end thereof, one of said closure members having an axial bore therethrough, an inner cylindrical casing positioned in said outer casing coaxial therewith and transversely spaced therefrom to define an elongated annular chamber, a piston slidably mounted in said inner casing, said piston having a piston rod extending axially therefrom through said axial bore in said closure member, a resilient deformable and expandible sleeve positioned in said annular chamber extending substantially the length thereof and encompassing said inner casing, means securely retaining the ends of said resilient sleeve in fixed position, to define a variable volume gas chamber between the outer casing and said resilient sleeve and a variable volume liquid chamber between the inner casing and said resilient sleeve, means to charge said gas chamber with gas under pressure, means to charge the portion of said inner casing between the other closure member and the piston with liquid, and means providing communication between the liquid chamber and the portion of said inner casing to be charged with liquid and including at least one passageway through said inner casing, at least a portion of said means securely retaining the ends of said resilient sleeve in fixed position precluding blockage of said at least one passageway of said communication means.

3,947,004
LIQUID SPRING, VEHICLE SUSPENSION SYSTEM AND METHOD FOR PRODUCING A LOW VARIANCE IN NATURAL FREQUENCY OVER A PREDETERMINED LOAD RANGE

Douglas P. Taylor, Grand Island, N.Y., assignor to Tayco Developments, Inc., North Tonawanda, N.Y.

Filed Dec. 23, 1974, Ser. No. 535,349
Int. Cl.² F16F 5/00
U.S. Cl. 267—65 R **11 Claims**

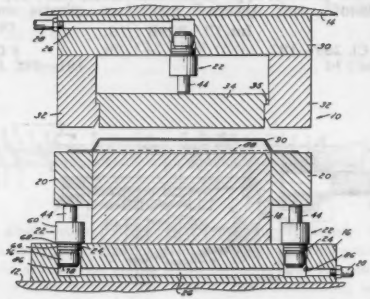


1. A method of obtaining a low variance in suspension frequency of an object comprising the steps of establishing the constant natural frequency which is desired, calculating the varying spring rate required to maintain the desired suspension frequency throughout a predetermined load range, selecting spring means having a varying spring rate which approaches the said calculated varying spring rate, and utilizing said spring means for supporting said object.

3,947,005
FLUID SPRING ASSEMBLY

Bernard J. Wallis, 25200 Trowbridge Ave., Dearborn, Mich. 48124

Continuation-in-part of Ser. No. 475,040, May 31, 1974, abandoned. This application Dec. 24, 1974, Ser. No. 536,084
Int. Cl.² F16F 9/10
U.S. Cl. 267—119 **20 Claims**



1. In a die assembly of the type which includes a pair of spaced apart die members which are mounted on a pair of supports guided for relative movement toward and away from each other in a rectilinear path to form a workpiece between the dies, the combination comprising, a plurality of fluid springs extending between at least one of said die members and its respective support, said springs yieldably biasing the die member in a direction away from its support, each of said fluid springs comprising a fluid cylinder and a piston and piston rod within the cylinder, said piston and piston rod being constrained by said cylinder to move axially therein along a path accurately concentric to the axis of the cylinder, an annular member rigidly mounted on said support with its axis extending parallel to said rectilinear path of die travel, said cylinder being arranged within said annular member generally coaxial therewith and opening at its lower end into said annular member, means tiltably supporting said cylinder within said annular member and resilient means interposed between said annular member and said cylinder and forming a seal therebetween which permits limited tilting movement of the cylinder relative to the axis of the annular member in response to the application of an axial force to the piston rod by its associated die member which is inclined to the central axis of the annular member.

3,947,006
GAS SPRING, PISTON LOCKING

Hans-Peter Bauer, Ziegelhutte 9, 8503 Altdorf, and Hans Jurgen Bauer, am Eichenhain 8, 8505 Rothenbach, both of Germany

Filed Dec. 20, 1974, Ser. No. 535,132
Int. Cl.² F16F 5/00
U.S. Cl. 267—120 **5 Claims**

1. In a gas spring comprising a cylindrical housing, a piston rod acting as a compressing piston mounted coaxially in said housing and protruding from one end of the housing, a guide piston at the internal end of said piston rod, a seal resting against the piston rod and fastened axially in said housing at the end of said housing at which the piston rod emerges, and

elastically flexible shock absorber for said guide piston, mounted adjacent said seal, the improvement comprising:

a snap ring carried by and in an annular groove on the outside circumferential surface of said guide piston and

an annular recessed groove provided in the internal wall of said housing partially and releasably accepting the said snap ring when the said guide piston is resting against said shock absorber.

3,947,007

SHOCK AND VIBRATION INSULATOR

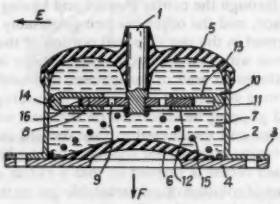
Patrice Pelat, Paris, France, assignor to Vibrachoc, Paris, France

Filed Dec. 20, 1974, Ser. No. 534,864

Claims priority, application France, Dec. 21, 1973, 73.45978

Int. Cl.² F16F 9/10

U.S. Cl. 267—136 **12 Claims**



1. A shock and vibration insulator comprising:

a closed volume including a peripheral rigid element defining, in part, said closed volume and being fastenable to a portion of an installation to be damped,

an axial rigid element having one end disposed inside of said closed volume and another end disposed outside of said closed volume so as to be fastenable to another portion of the installation,

said axial rigid element and said peripheral rigid element being movable relative to one another,

a radial rigid element extending radially between said axial rigid element and said peripheral rigid element and being solidly fixed to one of said rigid elements, said radial rigid element being capable of being subjected to the thrust of a fluid and including:

a. a first radial part having an internal recess in the shape of an annular groove, and

b. a second radial part having a peripheral edge with said edge extending into said recess of said first radial part to define an annular chamber and said first and second radial parts being movable relative to one another to vary the volume of said annular chamber,

said closed volume and said annular chamber being filled with fluid.

3,947,008

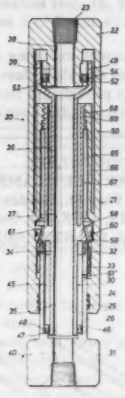
DRILL STRING SHOCK ABSORBER

Albert A. Mullins, Richmond, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Dec. 23, 1974, Ser. No. 535,524

Int. Cl.² F16F 7/00

U.S. Cl. 267—137 **14 Claims**



1. Apparatus for use in isolating a drill string from vibrations and shock loads caused by the drilling action of a drill bit, comprising: telescopically arranged mandrel and housing members adapted for connection between a drill bit and a drill string, said members being corotatively coupled and arranged for limited longitudinal relative movement; and resilient means for yieldably resisting said relative movement, including cylindrical spring means having one end fixed to one of said members, and axial cam means connected to the other of said members and coacting with the other end of said spring means for applying a twisting moment thereto in response to said longitudinal relative movement, said spring means providing a reaction torque responsive to the application of said twisting moment tending to maintain the relative longitudinal position of said members.

3,947,009

DRILL SHOCK ABSORBER

Jack D. Nelmark, New Berlin, Wis., assignor to Bucyrus-Erie Company, South Milwaukee, Wis.

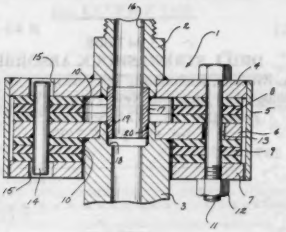
Filed Dec. 23, 1974, Ser. No. 535,736

Int. Cl.² F16F 15/10

U.S. Cl. 267—137 **5 Claims**

1. In a drill shock absorber having hollow drive shaft and driven shaft members with their open ends aligned with and spaced from one another, a drive plate fixed on the end of said drive shaft member, a driven plate fixed on the end of said driven shaft member which is in spaced, faced relation to said drive plate, and annular resilient means sandwiched between said drive and driven plates with a hollow interior encircling the ends of said drive and driven shaft members, the improvement therein of:

a shielding sleeve disposed between and in coupled engagement with each of said ends of said drive shaft and driven shaft members that forms a duct communicating between the ends of said hollow members, and shields said resilient means from fluid flow through said shaft members; and



said coupled engagement including a resilient seal interposed between said shielding sleeve and at least one of said shaft members providing a flexible coupling permitting limited displacement between said shaft members.

3,947,010

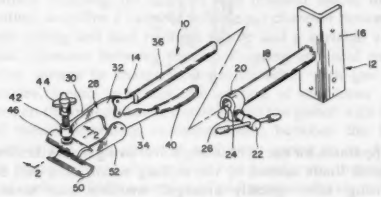
SERVICE CLAMP

Miles Zeller, 12861-53 West St., Garden Grove, Calif. 92640

Filed July 14, 1975, Ser. No. 595,677

Int. Cl.² B23Q *3/02*

U.S. Cl. 269—100 **1 Claim**



1. An improved service clamp for use in the servicing and repair of bicycles, or the like, the clamp comprising:

a base clamp element adapted to be supported at a predetermined height above the floor or ground surface and including support means, a rod extending from the support means and a collar operatively associated with the rod to define a selectively determined clamping opening at the rod terminal spaced from the support means for the base clamp element; and

a bicycle frame clamp element adapted to be supported in and selectively rigidly secured with respect to the base clamp element, the frame clamp including spaced apart, movable, frame clamp elements adapted to be placed about a bicycle frame and means to cause at least one of the clamp elements to be moved with respect to the other to define means for gripping a bicycle frame between the clamp elements, the frame clamp member being further defined by a first irregular shaped element having first and second legs joined by a central member extending therebetween, a first handle joined to the central member, a second handle element joined to the central member and the second leg, a first frame clamp element operatively associated with the first leg of the bicycle frame clamp and a second frame clamp element rigidly secured to the central member and second leg of the irregular shaped element of the frame clamp member, wherein the first frame clamp is movable with respect to the first leg and to the second frame clamp element of the assembly whereby when the first frame clamp element is moved away from the second, an opening is defined therebetween of sufficient magnitude to fit a bicycle frame portion therebetween and when the first frame clamp element is moved toward the second frame clamp element, a clamping action occurs about the bicycle frame portion.

3,947,011

CLAMP USABLE AS JIG AND LIFTING CLAMP

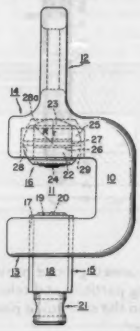
Yoshizo Tsuyama, No. 2698-2 Futana-cho, Nara, Nara, Japan

Filed Mar. 19, 1975, Ser. No. 559,630

Claims priority, application Japan, May 16, 1974, 49-54843

Int. Cl.² B25B *1/10*

U.S. Cl. 269—249 **5 Claims**



1. A clamp comprising a clamp body including a shackle for engagement with pulling means and a slot for receiving an article, and a pair of jaws mounted on opposed leg portions on opposite side of said slot for cooperatively gripping said article in said slot, wherein one of said jaws is comprised of a screw rod having a gripping head formed on the front end thereof and threadedly mounted on one of said leg portions to be movable back and forth relative to said article gripped in said slot, the other of said jaws is comprised of a substantially cylindrical gripping member having a gripping head formed on the front end thereof and a ring slidably mounting said gripping member through the center thereof and having a spherical outer surface, said the other jaw being rotatably mounted in a recess formed in the slot side wall portion of the other of said leg portions with said spherical outer surface in slidable contact with the inner wall of said recess, and said gripping member is formed whereby at least one of the average curved surface of said gripping head formed on the front end of said gripping member and the curved surface formed on the rear end of said gripping member for sliding contact with the bottom wall of said recess is formed so that a radius extending from the center of rotation of said rotatable jaw to the peripheral portion of said curved surface is greater than a radius extending from the center of rotation of said rotatable jaw to the central portion of said curved surface.

3,947,012

CUTTING BOARD

Westray S. Cobb, 1820 Casselberry Road, Louisville, Ky. 40205

Continuation-in-part of Ser. No. 336,431, Feb. 28, 1973, Pat. No. 3,837,634. This application July 30, 1974, Ser. No. 493,239

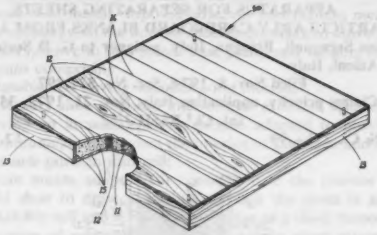
The portion of the term of this patent subsequent to Sept. 24, 1991, has been disclaimed.

Int. Cl.² B23Q *3/00*

U.S. Cl. 269—289 R **8 Claims**

1. A cutting board comprising: a particle board core; a layer of water-resistant adhesive completely coating the top and bottom surfaces of said particle board core; a plurality of thin

veneer sheets adhesively attached to one surface of said particle board core in an orderly fashion to provide a durable cutting surface thereon to give said board the appearance of being of solid lumber construction; an opposed surface of said particle board core having at least one veneer sheet adhesively



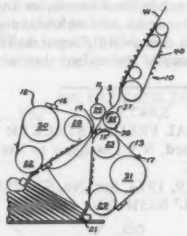
attached thereto; edge coverings along the periphery of the particle board core and in fluid tight communication therewith; said adhesive coating being further characterized in that it forms a water-resistant barrier and attaches said veneer sheets to said core.

3,947,013

METHOD OF ZIG-ZAG FOLDING AND APPARATUS THEREFOR

Ernst Daniel Nystrand, Green Bay, Wis., assignor to Paper Converting Machine Company, Green Bay, Wis.

Filed July 22, 1974, Ser. No. 490,239
Int. Cl.² B65H *45/20*
U.S. Cl. 270—79 **2 Claims**



1. Apparatus for cyclically folding a continuous web in zig-zag fashion comprising:

a frame,

web advancing means on said frame adapted to advance said web uniformly at a predetermined speed continuously along a path within said frame,

a pair of endless conveying loops mounted on said frame on opposite sides of the web path and each carrying tuckers and grippers alternately spaced thereon and arranged that a tucker of one loop cooperates with a gripper of the other loop to develop a transverse fold in said web and then a gripper of said one loop cooperates with a tucker of said other loop in developing the next transverse fold in said web wherein one cycle is completed between each successive tuckergripper engagement,

means on said frame for moving said tuckers and grippers on said loops along divergent paths from a first location where said tuckers and grippers transversely grip said web, said first location being a spaced distance from said advancing means,

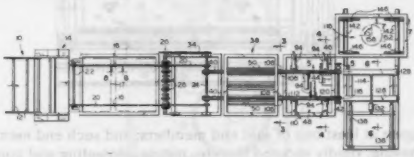
means on said frame in said path and located between said advancing means and said first location for retarding said web intermittently each cycle between successive tucker-web engagements in said first location, said retarding means including a pair of retard rolls matingly engaging said web to drive it at a surface speed less than said predetermined speed to create a web surplus between said advancing means and said retarding means, a portion of the circumference of one of said rolls having a smaller radius than the remainder thereof to cyclically release said surplus at the time of tucker-web engagement in said first location.

3,947,014

MACHINE FOR MANUFACTURING ARTICLES OF FOLDED PLASTERBOARD

James P. Petermann, Tigard; William E. Dolinar, and Stanley V. Ehrlich, both of Portland, all of Oreg., assignors to Georgia Pacific Corporation, Portland, Oreg.

Division of Ser. No. 459,674, April 10, 1974, Pat. No. 3,885,725. This application Dec. 16, 1974, Ser. No. 533,283
Int. Cl.² B65H *45/18*
U.S. Cl. 270—84 **8 Claims**



1. Apparatus for folding sheet members, comprising;

a plurality of upper arms;

a plurality of lower arms;

conveyor means for conveying sheet members between said upper and lower arms;

first means for moving said upper and lower arms toward and away from each other; and

second means for pivoting at least some of said arms to fold the sheet member by compressing it between said upper and lower arms into a folded member.

3,947,015

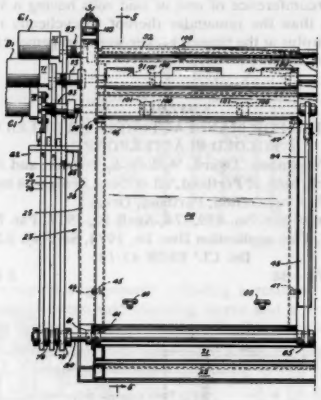
PAPER SHEET FEEDERS HAVING MULTIPLE STORAGE MAGAZINES

Rudolph Funk, Jamison, and Roger S. Funk, Holicong, both of Pa., assignors to R. Funk & Co., Inc., Doylestown, Pa.

Continuation of Ser. No. 151,723, June 10, 1971, abandoned. This application Oct. 19, 1973, Ser. No. 407,967
Int. Cl.² B65H *1/28, 3/06*
U.S. Cl. 271—9 **1 Claim**

1. In a paper sheet feeder of the type having a plurality of adjacent, generally upright and parallel sheet storage magazines, each dimensioned to store a stack of sheets of a different size, each magazine having a stack loading and sheet egress opening adjacent an upper edge portion thereof, and means for engaging the sheet stack in each magazine and for feeding the sheets, one at a time, from any selected magazine through the magazine opening and toward a zone of paper use, the improvements which comprise: a plurality of feed rolls each disposed within a corresponding one of said magazines for contact with an upper portion of a side sheet of the stack in that magazine, said feed rolls being rotatable to drive the contacted sheet outwardly of the magazine opening; a plurality of elongate lever means each disposed exteriorly of and having portions adjacent a corresponding one of said magazines; and each carrying one of said feed rolls, with freedom for swinging movement of the roll away from the stack in its corresponding magazine; means disposed in the region of the lower edges of said magazines and establishing a single axis extending in a direction transverse the planes of swinging movement of said lever means; means mounting lower end portions of each said lever means with freedom for pivotal movement about said single axis, and consequent swinging

movement of each feed roll toward and away from its magazine stack; rigid frame means having spaced, vertically extending, end members supporting said magazines therebetween, said means for mounting said lever means being supported



upon at least one of said end members; and such end member having, rigidly secured thereto, means contacting and confining intermediate portions of said lever means and preventing twisting movements of the latter.

3,947,016

CONTROL ARRANGEMENT FOR SHEET FEEDER

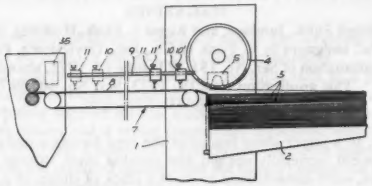
Adolf Horung, Rohrbach, and Werner Kistner, Neckarweihingen, both of Germany, assignors to Maschinenbau Oppenweiler GmbH, Oppenweiler, Germany

Filed May 14, 1974, Ser. No. 469,896

Claims priority, application Germany, May 14, 1973, 2324261

Int. Cl.² B65H *3/10, 5/02*

U.S. Cl. 271—12 **17 Claims**



1. A control device for a sheet feeder, said sheet feeder including pickup means to remove individual sheets from a stack of such sheets and conveying means arranged to accept said individual sheets from said pickup means and transport said individual sheets along a transport path away from said pickup means; said control device including

first sensing means mounted along said transport path at a first predetermined distance from said pickup means, said first sensing means being responsive to the passage of the trailing edge of each of said sheets along said transport path to generate first control signals;

second sensing means mounted along said transport path at a second predetermined distance from said pickup means, said second predetermined distance being greater than said first predetermined distance, said second sensing means being responsive to the passage of the leading edge of each of said sheets to generate a second control signal; and

a first logic circuit which is connected to said first and said second sensing means and is responsive to said first control signal to activate said pickup means and to said second control signal to deactivate said pickup means.

3,947,017

APPARATUS FOR SEPARATING SHEETS, PARTICULARLY CARDBOARD BLANKS FROM A PILE

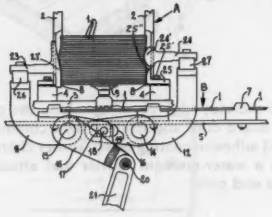
Enzo Seragnoli, Bologna, Italy, assignor to G. D Societa Per Azioni, Italy

Filed Nov. 8, 1974, Ser. No. 522,297

Claims priority, application Italy, Nov. 21, 1973, 3529/73

Int. Cl.² B65H *3/62*

U.S. Cl. 271—99 **12 Claims**



1. Apparatus for separating sheets from a pile, comprising: a first pusher located opposite a lower part of one side of a pile of sheets; a second pusher located opposite a lower part of the opposite side of the pile, below the first pusher; power means for moving the first and second pushers against and away from the respective sides of the pile in lateral directions approximately along mutual contact planes of the sheets to slightly laterally shift mutually superposed sheets, in and relative to the pile; and suction means located below the pile and disposed to engage, and to downwardly separate from the pile, successive lowermost ones of the shifted sheets.

3,947,018

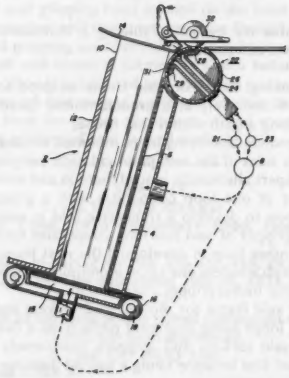
UNIVERSAL FEEDER-STACKER

Klaus K. Stange, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 19, 1974, Ser. No. 534,255

Int. Cl.² B65H *3/10, 29/24*

U.S. Cl. 271—99 **3 Claims**



1. Apparatus for displacing the bottom sheet in a stack of sheets comprising:

a sheet tray adapted to receive a stack of sheets therein, said tray including perforate plenum means forming a planar base plate for supporting the stack of sheets in a planar condition;

means for supplying air under pressure to said plenum means to create an air cushion between the bottom sheet in the stack and said planar base plate;

vacuum feed means disposed adjacent said plenum means for contact with the bottom sheet in the stack to move the sheet relative to said planar base plate, said vacuum feed means comprising

a rotatable roll having vacuum ports therein;

a stationary shoe disposed interiorly of said roll, said shoe having an arcuate opening therein adapted to provide communication between the interior of said shoe and the vacuum ports in said roll;

vacuum means adapted for connection to the interior of said shoe to draw a vacuum through the ports in said rotatable roll and retain the lead edge of a sheet thereon, rotation of said roll thereby moving the sheet retained thereon relative to said plenum means;

said rotatable roll being reversible, rotation of said roll in a direction such that the surface thereof adjacent said planar base plate moves away from said base plate causing the bottom sheet in the stack to be separated from the remainder of the sheets in the stack and fed therefrom, rotation of said roll in the opposite direction causing a sheet retained thereon to be inserted into the stack as the bottom sheet thereof; and,

an idler roll adapted for cooperation with said vacuum roll, entry of a sheet between said idler roll and said vacuum roll causing the sheet to be transported thereby.

3,947,019

COPY PAPER SHEET SEPARATING DEVICE

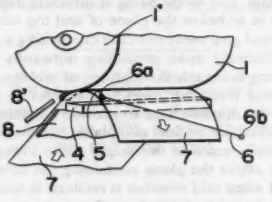
Susumu Tanaka, Sakai; Yuji Enoguchi, Osaka, and Hidetoshi Kawabata, Tondabayashi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed June 5, 1974, Ser. No. 476,619

Claims priority, application Japan, July 27, 1973, 48-89572[U]

Int. Cl.² B65H *29/56*

U.S. Cl. 271—174 **13 Claims**



5. A separating device, for use in an electrostatic photocopying apparatus of the type including a movable photoreceptor and an image transferring means, for separating copying paper from said photoreceptor, said device comprising:

an insulating tape member disposed between an image transferring means and a photoreceptor of an electrostatic photocopying apparatus;

said tape member facing one edge of a surface of said photoreceptor in a direction of advance of the copying paper;

said tape member being provided in a position allowing the transfer of an image from said photoreceptor surface to said copying paper, and said tape having surface means for guiding the leading portion of one side edge of said copying paper away from said photoreceptor surface for initial separation thereof from said photoreceptor; and

a thread member secured at one end thereof to said insulating tape member and stretchably disposed ahead of said tape member in an inclined direction relative to said direction of advance of said copying paper, said thread member comprising means for completely separating the advancing copying paper from said photoreceptor surface.

3,947,020

DEVICE FOR AUTOMATICALLY SEPARATING A PHOTOSENSITIVE SHEET FROM AN ORIGINAL FOR COPYING APPARATUS

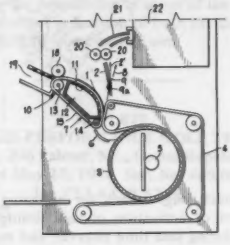
Yugoro Kobayashi, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 378,820, July 13, 1973, abandoned. This application Dec. 26, 1974, Ser. No. 536,462

Claims priority, application Japan, July 21, 1972, 47-72492

Int. Cl.² B65H *29/64*

U.S. Cl. 271—172 **3 Claims**



1. For use to produce copies of originals, on copy sheets having a practical curling limit not greater than a predetermined value, with copying apparatus wherein an original and a copy sheet are delivered together along a common path, a device for separating an original from a copy sheet, comprising

a. suction means, disposed adjacent the path on one side thereof in position to face an original advancing therealong, for drawing an original therefrom, said suction means having a convexly curved suction surface facing said path and including at least one conveyor belt movable along said suction surface; and

b. a stationary guide plate, disposed adjacent the path on the opposite side thereof from, and in facing relation to, the suction means and in position to face a copy sheet advancing along the path between the suction surface and the guide plate, said guide plate having a guide surface facing said path and said suction surface for engaging and guiding an advancing copy sheet to a predetermined locality beyond said guide plate;

wherein the improvement comprises

c. said guide surface of said guide plate being curved concavely with a degree of curvature greater than said predetermined value; and

d. said suction surface having a degree of convex curvature greater than the degree of concave curvature of said guide surface.

3,947,021

BAG REMOVING APPARATUS

Gary G. Plate, Burlington, Canada, assignor to A.T.R. Equipment Industries Ltd., Mississauga, Canada

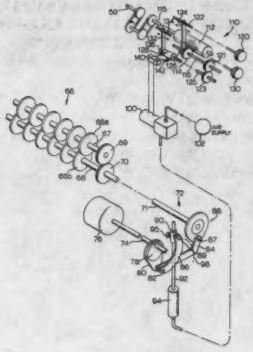
Filed Feb. 7, 1975, Ser. No. 548,123

Int. Cl.² B65H *29/22, 29/68*

U.S. Cl. 271—182 **1 Claim**

1. In a bag-making machine having a prime mover in which successively formed bags are discharged sequentially from the machine, the improvement comprising a pair of opposed stacking wheels for gripping said formed bags therebetween as they are discharged from the machine; adjustable speed con-

trol means operable to impart selective rotational velocity to said stacking wheels for slowing each of said discharging bags near the completion of its discharge; timing means operatively connected to said prime mover for causing said speed control means to operate for a fraction only of the time interval of



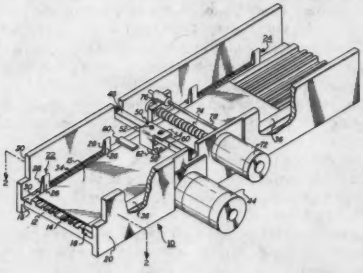
discharge of each bag; means for adjusting the instant of commencement of activation of said timing means by the prime mover during said time interval; and means for adjusting the duration of activation of said timing means by the prime mover during said time interval.

3,947,022

SELF-ALIGNING PINCH ROLL FOR MAGNETIC CARD TRANSPORT SYSTEM

Barry C. Kockler, Lewisville, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 7, 1974, Ser. No. 512,581
Int. Cl.² B65H *9/04, 5/06*
U.S. Cl. 271—250 **6 Claims**



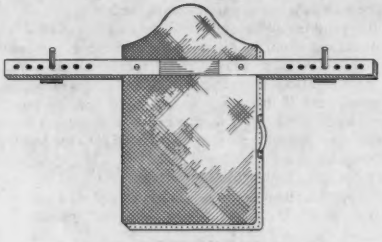
1. A card transport system comprising a card support member having a top surface, stationary guide means extending along one longitudinal edge of said support member and extending above said top surface, resilient means extending along the other longitudinal edge of said support member opposite said guide means, said resilient means being so constructed and arranged to apply a force in a direction generally perpendicular to the guide means and generally parallel to said top surface, an opening in said member extending through said top surface, a drive roll supported for rotation about an axis which is generally parallel to said top surface and having a portion thereof extending into said opening with a plane tangent to the periphery thereof being substantially coplaner with said top surface, means for driving said roll in opposite directions, a rotatable pinch roll located above said top surface opposite said drive roll and forming a card receiving nip with said drive roll, resilient means urging said pinch roll towards said drive roll, and means loosely mounting said pinch roll for pivotal movement thereof so that its axis pivots between about ½° and 3° relative to said support member in opposite directions from a line substantially perpendicular to said guide means about a vertical axis substantially normal to its axis of rotation and substantially normal to said top surface.

3,947,023

EXERCISE BOARD

Francisco Hidalgo Martin, P.O. Box 1, Blythe, Calif. 92225

Filed Aug. 12, 1974, Ser. No. 496,844
Int. Cl.² A63B *23/02*
U.S. Cl. 272—57 R **1 Claim**



1. An exercising apparatus for use in developing the muscles of a user's arms and torso comprising in combination: a generally rectangular board having a planar bottom surface for contact with the floor, an opposite planar top surface for supporting the torso of a user when reclining thereon; a detachable crossbar of uniform cross-section, said crossbar including a central casing and a pair of end sections each having a first extremity containing a plurality of like longitudinally spaced orifices and a second extremity removably insetable in said central casing; a transverse recess in said top surface of said board intersecting opposite side edges thereof for receiving said crossbar, said recess being of sufficient depth to retain said crossbar in or below the plane of said top surface and; a plurality of hand grip members each comprising a platen base having a cylindrical stake projecting outwardly therefrom, said stake being insertable through any of said spaced orifices in said crossbar from the lower side thereof to project upwardly from the opposite side to provide a handgrip thereon at the location of said orifice, said platen bases having a thickness substantially equal to the height of the lower surface of said crossbar above the plane containing the bottom surface of said board when said crossbar is retained in said transverse recess, whereby said platen base functions to support the extremity of said crossbar above the floor when said cylindrical stake is inserted through any of said orifices to serve as a handgrip.

3,947,024

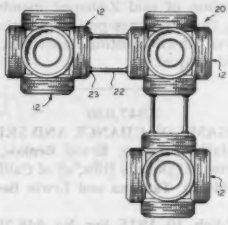
TIRETOYS

Gerald E. Slater, Milwaukee, Wis., assignor to Newtoys, Inc., Milwaukee, Wis.

Filed Mar. 12, 1974, Ser. No. 450,327
Int. Cl.² A63B *9/00;* **B44C** *1/08*
U.S. Cl. 272—60 R **4 Claims**

4. Children's playground equipment comprising:
at least two spaced apart, substantially coaxial tire bodies,
fastening means interconnecting said spaced apart tire bodies, said fastening means comprising a plurality of pipe means interconnecting adjacent ones of said tire bodies through the sidewall portions thereof, and

a substantially uniform coating of a cured epoxy resin on at least the exterior surfaces of said tire bodies, said coating having been applied as a 50/50 mixture of an epi-

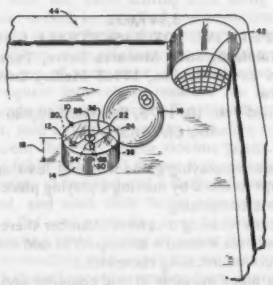


chlorohydrin-bisphenol epoxy resin and a polyamide curing agent which is the reaction product of a dimerized fatty acid and an aliphatic amine.

3,947,025
ARM WRESTLING UNIT
John M. Hobby, Jr., 1463 Jeffwood, Pontiac, Mich. 48054
Filed Nov. 8, 1974, Ser. No. 521,959
Int. Cl.² A63B *23/00*
U.S. Cl. 272—83 R **7 Claims**

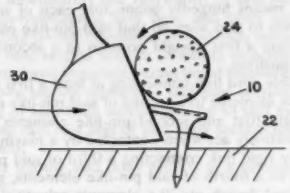
1. An arm wrestling testing and exercise device comprising a base, a tubular sleeve mounted to said base at an oblique angle thereto, a helical coil spring with an extension handle projecting from one end thereof and engaging said sleeve at the other end thereof, and an elbow rest on said base under said handle.

3,947,026
BILLIARD TRAINING DEVICE
Robert J. Scoutten, 3 Laurel Way, Kentfield, Calif. 94904
Filed Apr. 24, 1975, Ser. No. 571,272
Int. Cl.² A63D *15/00*
U.S. Cl. 273—2 **17 Claims**



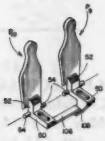
15. A billiard training device for visually indicating the point of contact, and for teaching the correct point of aim for a cue ball, comprising: unitary means having a top surface in the form of a substantially planar circular surface, the diameter of said circular surface being between about 2⅛ and 2⅜ inches so as to approximate the diameter of a standard cue ball as used in a billiard game, said unitary means including support means for said planar circular surface, said support means having a height substantially one half the diameter of said flat circular surface so as to approximate one half the height of said standard cue ball, whereby said flat circular surface can be positioned immediately adjacent an object ball at substantially one half the height thereof, said substantially planar circular surface being provided with indicia means in the form of a point of contact indicator at a peripheral edge of said circular surface and a point of aim indicator at the center of said circular surface, whereby said billiard training device can be positioned immediately adjacent an object ball with the point of contact indicator in contact with the object ball, and with both the point of contact and point of aim indicators along the desired line of travel of the object ball, to thus provide a correct indication of both the desired point of contact and a desired true point of aim.

3,947,027
HIGH PERFORMANCE GOLF TEE
David F. Brown, 236 Palmer, NE., Grand Rapids, Mich. 49505
Filed May 13, 1974, Ser. No. 469,084
Int. Cl.² A63B *57/00*
U.S. Cl. 273—33 **16 Claims**



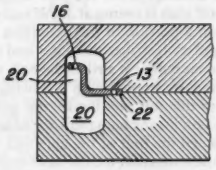
1. A golf tee comprising ball supporting means adapted to support a golf ball at a point above the ground, and substantially rigid extension means extending substantially horizontally from the ball supporting means to an outer end positioned a sufficient distance from the ball supporting means such that when a golf club is swung at a golf ball resting on the golf tee with at least a portion of the extension means facing the golf club, the golf club strikes the outer end of the portion of the extension means before it strikes the ball, said extension means being adapted, on impact with the swinging golf club, to impart motion to the golf ball before the golf club strikes the ball, said extension means being further adapted to permit direct contact between the fact of the club and the surface of the golf ball after the extension means has been struck by the swinging golf club, the outer end of the extension means including a substantially horizontal, wide, nonpointed golf club contact surface that is capable of withstanding repeated engagement with a swinging golf club along said surface without marring the golf club or injuring or deforming the outer end of the extension means, the extension means also being sufficiently durable to withstand repeated engagement with a swinging golf club without injury to the extension means.

3,947,028
TOY BOWLING GAME
Adolph E. Goldfarb, 4614 Monarca Drive, Tarzana, Calif. 91356, and Erwin Benkoe, 17965 Medley Drive, Encino, Calif. 91316
Filed Feb. 10, 1975, Ser. No. 548,782
Int. Cl.² A63D 3/00
U.S. Cl. 273—41 7 Claims



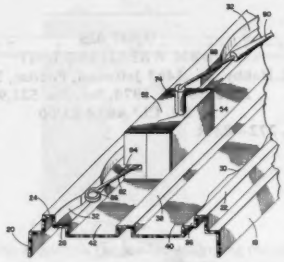
1. A toy bowling game comprising:
a. a bowling alley,
b. a plurality of rows of bowling pin-like elements with a plurality of pin-like elements in some of said rows,
c. hinge means hingedly connecting each of said pin-like elements to said alley so that said pin-like elements can shift from a first upright position to a second knocked-down position,
d. a flexible cord link connecting at least a first one of said pin-like elements to a second of said pin-like elements so that said first and second pin-like elements selectively cooperatively act when contacted by a playing piece,
e. a fairly rigid link connecting a third of said pin-like elements to a fourth of said pin-like elements, so that said third and fourth pin-like elements selectively cooperatively act when contacted by a playing piece.

3,947,029
LOW DENSITY CAST RACQUET
Peter Christopher John Gallagher, Hightstown, N.J., assignor to N L Industries, Inc., New York, N.Y.
Filed May 31, 1974, Ser. No. 475,166
Int. Cl.² A63B 51/00, 49/12
U.S. Cl. 273—73 D 11 Claims



1. A cast racquet comprising an integral solid head-portion enclosing a stringing area, a handle, and stringing means conforming to the shape of said head-portion, said head-portion and handle formed of low density castable material, said stringing means consisting of a separate, one-piece, wrought sheet metal member Z-shaped in cross section, said Z-shaped wrought metal member having an outer portion comprising an implant encapsulated by said cast head-portion, and a perforated inner stringing portion extending inwardly beyond the inner peripheral wall of said head-portion and in the plane of the stringing area of said cast head-portion, the said outer encapsulated portion of said Z-shaped member being displaced vertically from its inner perforated stringing portion the perforations of which constitute apertures for receiving the strings of said racquet.

3,947,030
TOY GAME OF CHANCE AND SKILL
Adolph E. Goldfarb, Tarzana; Erwin Benkoe, Encino, and Dennis H. Merino, El Dorado Hills, all of Calif., assignors to Adolph E. Goldfarb, Tarzana and Erwin Benkoe, Encino, both of, Calif.
Filed Feb. 10, 1975, Ser. No. 548,796
Int. Cl.² A63F 9/14
U.S. Cl. 273—85 R 8 Claims



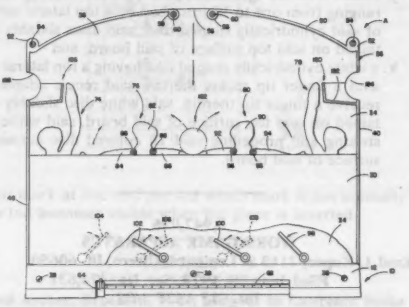
1. A toy game of chance and skill comprising:
a. a pair of opposed inclined ramps located in operative relationship to each other,
b. a movable member capable of being disposed in each of said ramps at opposite ends thereof for movement toward each other,
c. a projected element operatively mounted on each of said movable members and shifting in a reciprocative motion toward and away from the ramp in which the member it is associated with is located, and
d. camming means operable between said projected element of each said movable members and the associated ramp for moving the projected element in the reciprocative motion during movement down the inclined ramp, whereby the projected element of one movable member may engage the movable member in the other of the ramps and dislocate at least a portion of the same during movement on the respective ramps.

3,947,031
COMPETITIVE TOY BASKETBALL GAME
Adolph E. Goldfarb, 4614 Monarca Drive, Tarzana, Calif. 91356, and Erwin Benkoe, 17965 Medley Drive, Encino, Calif. 91316
Filed Feb. 10, 1975, Ser. No. 548,886
Int. Cl.² A63F 7/06
U.S. Cl. 273—85 C 12 Claims

1. A competitive playing game where at least one or more players attempt to score by moving a playing piece into a goal area, said game comprising:
a. plate means forming a central chamber therebetween,
b. a first goal area located with respect to said central chamber and communicating therewith,
c. a playing piece movable in said chamber and capable of being shifted toward said goal area,
d. at least one field player-figure in said chamber and having at least one articulatable appendage,

e. first namually operable lever means operatively connected to said articulatable appendage for moving same,

f. at least one first individual goal player-figure located in relationship to said first goal area,



g. second manually operable lever means operatively engageable with said first goal player-figure for causing said first goal player-figure to jump into goal blocking relationship to said first goal area, said second lever means not being mechanically physically attached to said first goal player-figure.

3,947,032

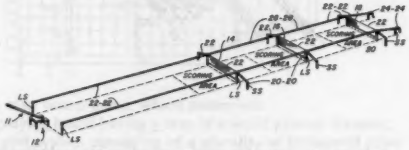
TIP CAT APPARATUS INCLUDING TARGET AREAS

Henry W. Spitzer, Star Rte. 36-91-A, Havre, Mont. 59501

Filed Oct. 16, 1974, Ser. No. 515,251

Int. Cl.² A63B *71/00*

U.S. Cl. 273—95 F **4 Claims**



1. In a lawn game device, the combination of a plurality of nets, each net being parallel to its adjacent net, the spacing between each pair of nets being approximately twice the longitudinal dimension of each net, one set of rope and stake means for each net, a pair of ropes and stake means to delineate the sidelines of a playing area, each sideline rope being perpendicularly related to each net, a starting table, receiving flippers and "sticks", staked to the ground approximately parallel to the closest net, and approximately five net lengths away from said first net, scoring areas facing the starting table in front of each net, each scoring area being equal to the length of a net in both longitudinal and transverse dimensions, and tensioning means for holding the various nets and ropes in proper position, each sideline rope being threaded through a ring at the top of each stake, and each rope being color-coded at frequent intervals to measure the location of the plural nets and scoring areas, each flipper and each stick being color-coded, said tensioning means including rope clamping means adjacent the ends of the sideline ropes remote from said starting table, each said flipper being elongated and has hand-grip means at one end and a flattened area adjacent the opposite end, and each stick being generally cylindrical in shape with a flat area extending over its longitudinal dimension, said starting table having an upper flat surface and an offset wall connecting said upper flat surface to a lower flat surface, a U-shaped recess extending from approximately the center of one edge to approximately the center of the table, and intersecting said offset wall, indicia means on said offset wall and adjacent areas, and one of said flat areas of said stick fitting within said area, said recess being of sufficient dimension to receive the flattened area of a flipper, and stake means secured to the bottom of the table to fix the position of the table with respect to said nets.

3,947,033

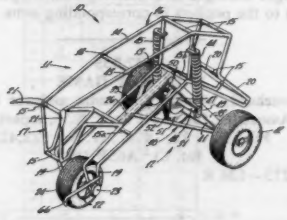
STEER ROPING TRAINING DEVICE

Randall A. Bennett, 539 N. Pierre Road, Walnut, Calif. 91789

Filed Aug. 2, 1974, Ser. No. 494,219

Int. Cl.² F41J *9/02*

U.S. Cl. 273—105.2 **9 Claims**



1. A self-guiding, trackless steer roping training device comprising:

a base section having a pair of spaced drive wheels mounted at the back thereof;

drive means mounted on said base section and being connected to at least one of said drive wheels for rotating said wheels and moving said base section;

a body section having at least one wheel mounted at the front thereof and including a pair of rear legs which extend downwardly and rearwardly of said base section;

means interconnecting said base and body sections and permitting pivotal movement of said body section relative to said base section about a forwardly-directed, generally horizontal axis to permit bidirectional sideward leaning of said body section relative to said base section, sideward leaning of said body section relative to said base section exposing said rear legs of said body section for roping of same; and

means for biasing said body section in a generally upright position.

3,947,034

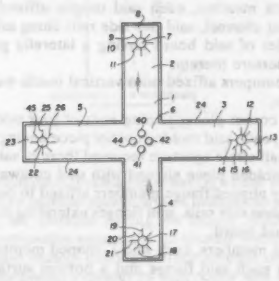
MARBLE GAME BOARD WITH SURFACE POCKETS

John L. Waters, Los Angeles, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Mar. 12, 1975, Ser. No. 557,505

Int. Cl.² A63F *7/00*

U.S. Cl. 273—123 R **2 Claims**



1. A marble game, comprising

a substantially cross-shaped gameboard having four substantially elongated arms extending radially from a cen-

tral area and equiangularly spaced by 90° from each other, the arms being of equal dimensions;

an open pocket in each of the arms in the area of the end thereof farthest from the central area, each of the pockets being adapted to accommodate a marble;

a plurality of channels formed in each of the arms and extending radially from the pocket in each of the arms;

rails extending along the edges of the arms to retain marbles on the arms;

four marbles; said marbles being placed at said central area and being in a closely arranged substantially square pattern; a drop marble; said drop marble being dropped from a height amongst said marbles in attempting to direct them to the pockets in corresponding arms.

3,947,035

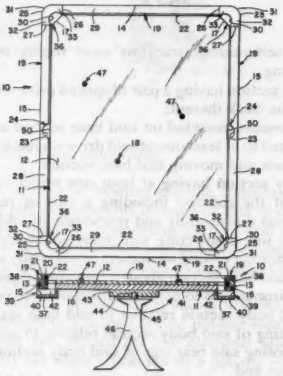
POOL DISC GAME

Andre Bouchard, Montreal, Canada, assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Nov. 11, 1974, Ser. No. 522,421

Int. Cl.² A63F *3/00*

U.S. Cl. 273—126 R **1 Claim**



1. A pool disc game which comprises:

a. a rectangularly shaped playing board having a top slippery surface, a rectilinear channel contained in said top surface along two lateral ends of two longitudinal sides of said board, four bias cutaway corners, and a half circle aperture midway on each said longitudinal side of said board;

b. side rails extending upwardly from said top surface, each said side rail formed from a block member having a tongue extending downwardly from a bottom surface of said block member, each said tongue affixed into said rectilinear channel, said two side rails along said longitudinal sides of said board having a laterally placed half circle aperture therein;

c. rubber bumpers affixed onto vertical inside walls of said side rails;

d. molded corner pieces joining ends of four said side rails together, each said molded corner piece having a laterally placed half circle aperture recessed therein, said aperture of said molded piece aligned with said cutaway corner;

e. vertically aligned flange members affixed to outside sidewalls of said side rails, said flanges extending downwardly below said board;

f. L-shaped members, each said L-shaped members affixed between each said flange and a bottom surface of said board forming a rectilinear chamber therein;

g. a mounting plate having a centrally placed vertical bore therein, said plate affixed to said bottom surface of said board;

h. a pedestal leg assembly;

i. a vertically placed rod affixed to a top of said leg assembly, said vertical rod rotatably contained in said bore of said plate;

j. fifteen colored cylindrically shaped disc having indicia ranging from one to 15 inscribed on a top lateral surface of said cylindrically shaped disc, said discs slidably contained on said top surface of said board; and

k. a white cylindrically shaped disc having a top lateral base with a finger tip recess therein, said recess adapted to receive a finger tip therein, said white disc slidably contained on said top surface of said board, said white disc striking and propelling said 15 colored disc across top surface of said board.

3,947,036

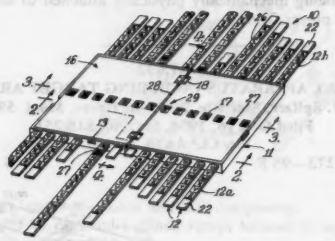
WORD GAME APPARATUS

Emil J. Kupec, 2113 S. Lombard, Cicero, Ill. 60650

Filed June 28, 1973, Ser. No. 374,631

Int. Cl.² A63F *3/00*

U.S. Cl. 273—130 E **1 Claim**



1. In an apparatus for playing word games including a base having a row of spaced openings, and a plurality of carriers manually adjustably mounted to said base associated one each with said openings, each carrier having an alphabetical set of letters identically disposed thereon to be exposed one at a time through the associated base opening whereby a group of selected letters may be viewed through said openings, the improvement comprising indicium means on each carrier at the mid-portion of the set of letters thereof for indicating that the associated carrier has not as yet been manipulated from a mid-portion to expose a selected letter in the playing of the game, said carriers defining opposite ends and each being provided at one end thereof with a selectively positionable manipulating portion hingedly connected to the carrier.

3,947,037

BOARD GAME APPARATUS

Satoshi Hasegawa, 6-506 Keyakidai-danchi, 1-13-2 Wakabacho, Tachikawa, Tokyo, Japan

Filed Jan. 23, 1975, Ser. No. 543,235

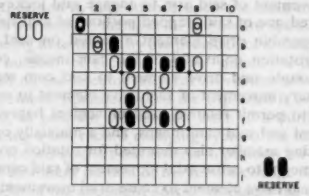
Claims priority, application Japan, Jan. 31, 1974, 49-13126

Int. Cl.² A63F *3/00*

U.S. Cl. 273—131 D **1 Claim**

1. Apparatus for playing a board game of the type using a board having checker-board squares and pieces movable thereon, comprising in combination: a game board having nine rows and ten columns of squares and marginal columns and marginal rows at the outer margins of the board, said marginal columns and rows being visually distinguishable from

the others, and a pair of sets of twelve each black and white pieces, all of an identical cylindroid shape, each having a



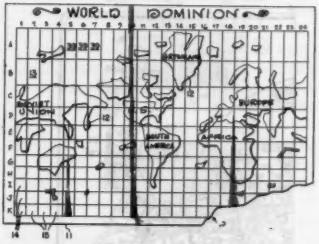
circular mark at one end portion which mark is not normally visible but becomes visible when the piece is inverted.

3,947,038

MAP BOARD GAME

Edward Archer, Brooklyn, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Apr. 14, 1975, Ser. No. 568,009
Int. Cl.² A63F *3/04*
U.S. Cl. 273—134 AC **5 Claims**



1. A map board game, which comprises:

a. a playing board having a map of a world printed thereon;

b. a grid system consisting of a plurality of horizontal rows and a plurality of vertical rows intersecting each other forming a plurality of squares, wherein said horizontal rows represent latitudinal direction and said vertical rows represent longitudinal direction;

c. a latitudinal spinner device for indicating latitudinal movement on said map;

d. a longitudinal spinner device for indicating longitudinal movement on said map;

e. a compass spinner device for indicating movement on said map from an ocean area of said map;

f. a plurality of nation cards for indicating nations on said map; and

g. a marker device for indicating position of each player on said map; wherein said marker device moves between said squares.

3,947,039

FOOTBALL BOARD GAME APPARATUS

John W. Sadler, and Theodore J. Sadler, both of 2015 Cypress Drive, Bel Air, Md. 21014

Filed Sept. 18, 1974, Ser. No. 507,245
Int. Cl.² A63F *3/00*
U.S. Cl. 273—134 CF **10 Claims**

1. A football game apparatus comprising in combination:

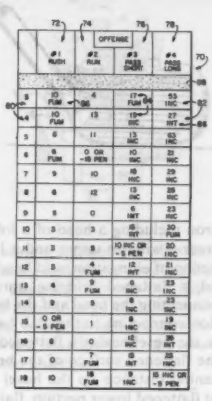
a game board having a model football field thereon divided transversely into yardage with end zones at both ends;

a playing piece movable along said game board during each play a yardage distance determined by the comparison of two chance selected values;

means for determining said two chance selected values for each play,

said means including

an offensive play board having a plurality of offensive blocks thereon, each offensive block containing a chance selected yardage value, and



a defensive play board having a plurality of defensive blocks thereon, each defensive block containing a chance selected yardage value; and

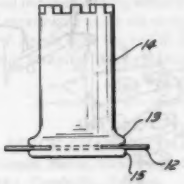
at least some of said offensive blocks and at least some of said defensive blocks further containing turn-over indicia which, when coinciding in said offensive blocks and said defensive blocks, indicates a turn-over of the playing piece from the offensive player to the defensive player.

3,947,040

INSTRUCTIONAL INDICIA CARRYING MEMBER FOR CHESS PIECE

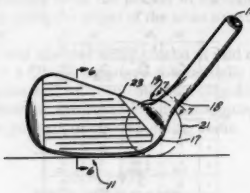
Harold Samuels, Locust Valley, N.Y., assignor to Adult Leisure Products Corporation, Locust Valley, N.Y.

Filed July 29, 1974, Ser. No. 492,511
Int. Cl.² A63F *3/02*
U.S. Cl. 273—137 R **3 Claims**



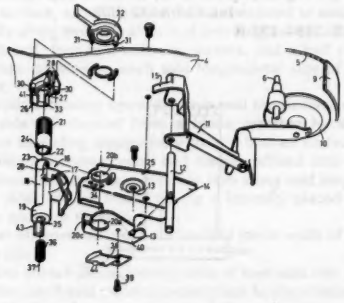
1. In combination, a chess piece having a base with a bottom surface and an annular recess; and an indicia carrying member comprising an element having an indicia bearing surface, means for removably mounting said element within said recess such that said indicia bearing surface extends outwardly beyond the peripheral confines of said recess and substantially parallel to the bottom surface of said base to form a skirt-like appendage for said piece, substantially all of said surface being visible when the piece is viewed from above.

3,947,041
GOLF CLUB
Jerry Barber, P.O. Box 550, La Canada, Calif. 91011
Filed Dec. 10, 1973, Ser. No. 423,062
Int. Cl.[2] A63B *53/04*
U.S. Cl. 273—167 G **7 Claims**



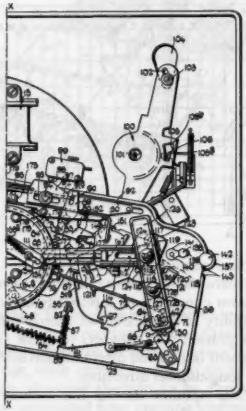
1. A golf club iron including a head of a lofted, generally elongated configuration with an upper and a lower edge extending in the direction of elongation, said head having a club face, a hosel, and a flattened bridging portion integrally formed with and connecting the head and the hosel (portion), said bridging portion connecting to the club head at one side of said upper edge, the hosel having a flattened lower portion continuous with the flattened surface of the bridging portion extending a substantial distance up the hosel and a tubular upper portion, said flattened lower portion, flattened bridging portion and club face upper edge connecting portion defining a concave surface, the hosel being angled and oriented with respect to the club face such that an extension of the center line of the (club shaft) upper portion of the hosel intersects the plane defined by the club face in the lower quadrant adjacent the heel end of the club face.

3,947,042
RECORD PLAYERS
Philip Henry Evans, Stourbridge, England, assignor to Glenburn Engineering (U.K.) Limited, England
Filed June 21, 1974, Ser. No. 481,541
Claims priority, application United Kingdom, June 29, 1973, 30974/73
Int. Cl.[2] G11B *15/29, 15/44*
U.S. Cl. 274—9 A **10 Claims**



1. A record player including a turntable, a motor, a member drivingly associated with the turntable, a spindle driven by the motor, a jockey pulley drivingly interposed between said spindle and member, said spindle being stepped to provide a plurality of portions of different diameter and said portions being slightly tapered whereby adjustment of the pulley axially of each portion permits a fine adjustment of the speed of rotation of the turntable speed change arm, on which said jockey pulley is rotatably mounted, means pivotally and slidably mounting said arm on said record player, cam means rotatably mounted on said record player and engaged by a part associated with said speed change arm to cause, when rotated, movement of said arm to engage said jockey pulley with a desired one of said stepped portions of said spindle, a manually operable drive element mounted on said record player for rotation co-axially of the cam means, coupling means to couple said drive element to said cam means to transmit rotary movement of said drive element to said cam means and to permit relative axial movement between said drive element and said cam means, and a manually operable pitch adjusting member also mounted for rotation co-axially of the cam means to cause axial movement of said cam means relative to said drive element to cause axial movement of said speed change arm and hence said jockey pulley to achieve said fine adjustment of the speed of rotation of the turntable.

3,947,043
RECORD PLAYER
Philip Henry Evans, Stourbridge, England, assignor to Glenburn Engineering (U.K.) Limited, England
Filed July 12, 1974, Ser. No. 487,891
Claims priority, application United Kingdom, July 19, 1973, 34504/73
Int. Cl.[2] G11B *15/00*
U.S. Cl. 274—10 R **5 Claims**



1. An automatic record player for playing disc records of different sizes comprising a deck plate, a motor, a turntable rotatable on the deck plate and driven, in use, by the motor, a centre spindle, extending upwardly from the centre of the turntable, a control member movable within the centre spindle to cause records to be fed singly in succession from the bottom of a stack supported on the spindle on to the turntable, a pick-up arm pivotally mounted for movement about a horizontal axis on the upper end of a vertical spindle, the vertical spindle being pivotally mounted for movement about a vertical axis relative to the deck plate, a drive gear rotatably mounted on the deck plate, means for rotating the drive gear by the motor during a record changing cycle, record change means driven from the drive gear to move the control member and to cause pivotal movement of the pick-up arm about said horizontal axis and of said vertical spindle about said vertical axis, a selector plate provided at the lower end of the vertical spindle, a selector latch mounted on the deck plate, the selector plate and latch having selectively inter-engageable abutments and the selector latch being movable, by said record change means, from a first position, in which free movement of the selector plate is permitted, into a second position for inter-engagement between desired abutments to limit pivotal

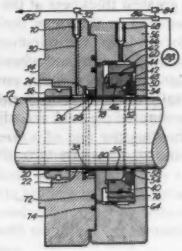
movement of the selector plate, switch-off means to switch-off the record player, actuating means to actuate said switch-off means comprising a trip latch movable from a first to a second position in dependence upon the resistance to movement of the control member of the centre spindle, the resistance being determined by the presence of at least a predetermined number of records on the spindle, a cut-out latch mounted on the selector latch for movement relative thereto, a trip element, operated when the trip latch is in said second position, to position the selector latch in a third position so that during a last record changing cycle at the end of playing the last record said cut-out latch is in position for engagement with an abutment portion of the record change means so that movement of the abutment portion displaces the cut-out latch so that a portion thereof is moved into position to actuate the switch-off means when the selector latch is moved to said first position by said record change means.

3,947,044

SECONDARY SEALING DEVICE

Jaromir Friedrich, Edmonton, Canada, assignor to Bralorne Resources Limited, Calgary, Canada

Filed July 7, 1975, Ser. No. 593,817
Int. Cl.² F16J *15/06, 15/24*
U.S. Cl. 277—3 **5 Claims**



1. In a pump for pumping pressurized gas and having a pump shaft, a main seal, a leakage ring surrounding said shaft permitting gas leakage within a predetermined pressure range and pressure sensing means, the improvement comprising annular deformable seal means radially spaced from said shaft, annular piston means axially slidable in an annular cylinder surrounding said shaft and peripherally abutting said seal means, and a source of highly pressurized fluid communicating with said cylinder, said sensing means including switch means whereby a pressure detected by said sensing means exceeding the maximum pressure of said range actuates said switch means to stop rotation of said shaft and to thereafter permit said fluid to enter said cylinder whereby said piston forces said seal means radially inwardly to sealingly engage said shaft and prevent further leakage therearound.

3,947,045

ROTARY SEALING MEANS

Wayne E. Schmidt, Scottsdale, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

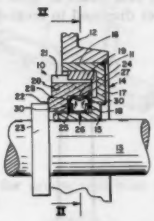
Filed Dec. 5, 1974, Ser. No. 529,643
Int. Cl.² F16J *15/38*
U.S. Cl. 277—87 **13 Claims**

1. Rotary seal means comprising:

a. a casing having spaced concentric inner and outer walls connected by an end wall and providing an annular chamber open at one end, said end wall having a continuous shoulder adjacent the inner wall;

b. an annular primary sealing element disposed in said chamber, said sealing element having a sealing face exposed at the open end of said casing and a continuous shoulder in spaced opposed relation to the shoulder in said casing;

c. an annular secondary sealing element disposed between said opposed shoulders, said secondary sealing element having spaced flaps connected by an annular wall and movable toward and away from one another, said flaps



having a sealing engagement with the opposed shoulders on said casing and primary sealing element; and

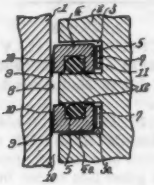
d. a spring disposed between the flaps of the secondary sealing element to urge said flap toward said shoulders, said spring engaging said inner wall to yieldably resist radial inward movement of said secondary sealing element in said chamber.

3,947,046

OIL SEAL RING FOR INTERNAL COMBUSTION ENGINE

Masayuki Maruyama, and Joichi Watanabe, both of Kashiwazaki, Japan, assignors to Riken Piston Ring Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 30, 1973, Ser. No. 365,128
Int. Cl.² F16J *15/00;* **F04C** *15/00*
U.S. Cl. 277—235 A **3 Claims**



1. An oil seal ring for an internal combustion engine, characterized in that it has an oil scraping edge formed by one end of a casehardened inclined sliding surface exhibiting a variable depth hardness maximized at its oil scraping edge and gradually decreasing in depth with the radial distance therefrom to provide good oil scraping performance over an extended service life.

3,947,047

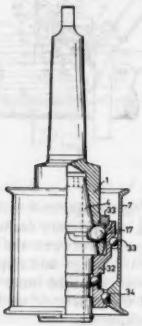
QUICK-CHANGE COLLET

Ture Oskar Hultman, Boras, Sweden, assignor to Aktiebolaget Eminentverktyg, Torshalla, Sweden

Filed May 31, 1974, Ser. No. 475,109
Claims priority, application Sweden, June 4, 1973, 73078529
Int. Cl.² B23B *31/22*
U.S. Cl. 279—1 B **5 Claims**

1. A quick change collet for detachably connecting a tool holding insert comprising: a collet sleeve disposed to internally receive said tool holding insert; locking means engaging both said collet sleeve and said insert, said locking means comprising a plurality of first ball-like members selectively passed through said collet sleeve to engage said insert; retain-

ing sleeve means surrounding said collet sleeve for controlling the position of said first ball-like members within said collet sleeve; a spring lock having an inner bearing ring retaining a plurality of second ball-like members, with said second ball-like members contacting a spring, said spring forcing said second ball-like members into contact with said insert where there are provided on said insert at least two axially spaced circumferential grooves disposed to receive said second ball-



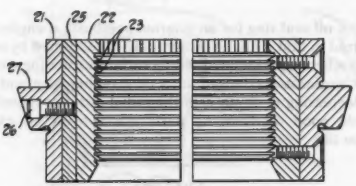
like members, said circumferential grooves allowing complete rotation of said insert in relation to said inner bearing ring; an outer sleeve surrounding said bearing ring attached only to said bearing ring through a bearing allowing rotation of said bearing ring within said outer sleeve while providing means for applying axial force to said inner bearing member, said axial force applied to said bearing ring moving said bearing ring axially thereby moving said retaining sleeve.

3,947,048

SEGMENTED CIRCUMFERENTIALLY SPLIT COLLET PAD WITH REPLACEABLE SERRATIONS

Kenneth C. Hubbell, 12916 N. Linden Lane, Parma, Ohio 44130

Filed Apr. 17, 1974, Ser. No. 461,744
Int. Cl.² B23B 5/22
U.S. Cl. 279—41 A **2 Claims**



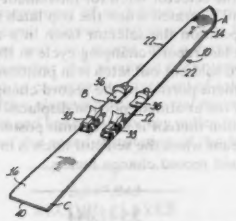
1. In an assembly of longitudinally sectioned collet pad segments removably disposed in a radially expansible collet the improvement comprising plural composite pad segments including an outer member detachably inserted in said collet, an inner liner member having an outer surface matched to the inner surface of said outer member, said liner having an inner surface for gripping a workpiece when engaged therewith under sufficient pressure, and separate fastening means to detachably secure the outer surface of said liner against the inner surface of said outer member to inhibit circumferential and radially inward movement of said liner relative to said outer member.

3,947,049

MONO-SKI

Alec Pedersen, 896 E. 35th Ave., Vancouver, British Columbia V5W 1B3, Canada

Filed Nov. 5, 1974, Ser. No. 521,103
Int. Cl.² A63C 5/12
U.S. Cl. 280—11.13 S **5 Claims**



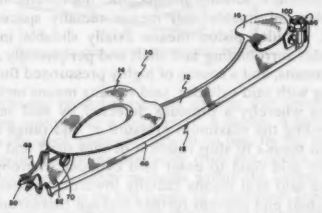
1. A moniski comprising: an elongated body having a central waist portion having a maximum width of about 6¼ inches, an upwardly curved forward tip region of maximum width about 6⅛ inches and an upwardly tapered and outwardly flared tail portion of maximum width about 7⅛ inches, said ski having its greatest thickness at the central waist portion, and being reduced in thickness both towards the tail portion and the forward tip, the minimum thickness being adjacent the forward tip region, and wherein the forward tip region is wider than the central waist portion, and the tail portion is substantially wider than the forward tip region; and including bindings monted on said ski adjacent said central waist portion for holding the feet of a skier in close side-by-side relation, with the bindings extending slightly over the side edges of the ski.

3,947,050

ICE SKATE

Kenneth D. Isely, 1627 N. Holyoke, Wichita, Kans. 67208

Filed Oct. 21, 1974, Ser. No. 516,389
Int. Cl.² A63L 1/32
U.S. Cl. 280—11.18 **13 Claims**



1. In an ice skate of the type including an integral skate base having an elongated lower edge of longitudinal convex curvature defining the blade edge of the skate, the improvement comprising the skate base being of nonintegral construction with the lowermost marginal portion of the skate base defining the blade edge of the base being separate from the remainder of the skate base, said portion and said remainder being respectively termed the blade and the skate body, said blade and said skate body having mating tongue and groove means interlocked along an intermediate portion of the longitudinal extent of the blade, and means adjacent the opposite longitudinal extremities of the blade for detachably securing the blade to the skate body, said blade being resilient and having a longitudinal radius of curvature in repose that is greater than that possessed by the same when secured to the skate body by

the securing means, whereby the blade is resiliently self-biased toward the skate body when secured to the latter.

3,947,051
SAFETY SKI BINDING WITH TRANSMITTER ARRANGED BETWEEN THE LEG AND THE SHOE OF THE SKIER

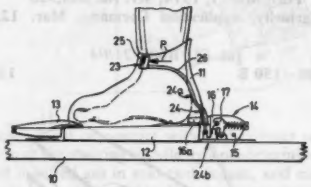
Brigitte Sittmann, Stuttgart, Germany, assignor to Vereinigte Baubeschlagfabriken Gretsch and Co. GmbH, Germany

Filed Feb. 22, 1974, Ser. No. 444,744

Claims priority, application Germany, Feb. 22, 1973, 2308754; Oct. 19, 1973, 2352433; Feb. 8, 1974, 2406015

Int. Cl.² A63L *9/08*

U.S. Cl. 280—11.35 R **54 Claims**



1. A safety ski binding with a release means for the binding, which includes a transmitter means for initiating the release operation of the binding during falls, said transmitter means being arranged between the leg and a part corresponding to a boot of the skier, wherein the transmitter means is arranged within the area of one of the two parts consisting of lower leg and foot of the skier and is operatively connected with the release means of the binding in such a manner that it responds directly to an excessive force acting between the leg and the boot of the skier with simultaneous transmission of such force to the release means,

wherein the transmitter means includes a hydraulic transmission means,

wherein the hydraulic transmission means includes two closed-off hydraulic partial systems, of which one partial system is mounted on one of the two parts consisting of leg and boot of the skier and of which the other partial system which is force-lockingly connected with the first partial system, is mounted on one of the two parts consisting of ski and of the binding to be released by the second partial system.

3,947,052
SKI BINDING

Richard A. Larson, Boulder, Colo., assignor to Hanson Industries Inc., Boulder, Colo.

Continuation-in-part of Ser. No. 275,449, July 28, 1972, abandoned. This application Nov. 6, 1974, Ser. No. 521,392

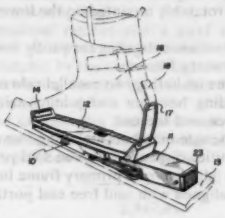
Int. Cl.² A63C *9/086*

U.S. Cl. 280—11.35 K **15 Claims**

1. A safety ski binding adapted for securing a ski boot to a ski comprising:

first means operatively connected between said ski and the toe of said boot for holding said toe in alignment with said ski, said first means being releasable in response to an applied predetermined force to permit said toe to move laterally inwardly with respect to said ski, while preventing outward lateral movement of said toe;

second means operatively connected between said ski and the heel of said boot for holding said heel in alignment with said ski, said second means being releasable in response to an applied predetermined force to permit said heel to move laterally inwardly with respect to said ski, while preventing outward lateral movement of said heel; and



biasing means for urging said boot into operative contact with said ski.

3,947,053
RETAINING MECHANISM FOR SAFETY SKI BINDINGS

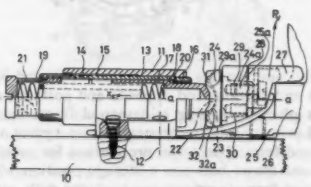
Brigitte Sittmann, Stuttgart, Germany, assignor to Vereinigte Baubeschlagfabriken Gretsch & Co., Leonberg, Germany

Filed May 24, 1974, Ser. No. 473,211

Claims priority, application Germany, May 25, 1973, 7319703[U]

Int. Cl.² A63C *9/08*

U.S. Cl. 280—11.35 K **22 Claims**



1. A retaining mechanism for safety ski bindings which includes a boot retaining means, a detent means a counter-detent means, a detent spring means biasing said detent means and said counter-detent means against one another, one of said detent means and counter-detent means being mounted at said boot retaining means, said detent means engaging in said counter-detent means and being operable, for the purpose of releasing the binding, to be forced out of the counter-detent means over a raised portion delimiting the counter-detent means while overcoming the detent spring force in case of strong forces acting from the ski boot on the retaining means, wherein the counter-detent means is delimited on different sides by differently shaped raised portions, the counter-detent means with the raised portions being rotatably arranged about an axis extending approximately in the direction of the detent engagement and being adapted to be secured in the preselected rotational position, said raised portion being configured to vary the forces acting from the ski boot required for release of the detent and counter-detent means in skiing use of the binding as a function of the rotational position of said counter-detent means.

3,947,054
FOLDING LUGGAGE CARRIER

Herbert Charles Hall, 4175 Oak Hollow Road, Claremont, Calif. 91711

Filed Nov. 4, 1974, Ser. No. 520,366

Int. Cl.² B62B *3/00*

U.S. Cl. 280—36 C **5 Claims**

1. A foldable carrier for hand luggage, comprising:

a substantially rectangular primary frame having normally upper and lower ends and normally front and rear sides

and including two parallel side members, and a normally lower cross-brace and a normally upper base extending between and joining said side members;

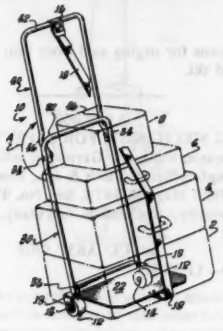
a pair of wheels rotatably mounted on the lower end of said frame;

luggage support means extending forwardly from the lower end of said primary frame;

a secondary frame including two parallel side members and a base extending between and joining said latter side members at one end thereof;

said second frame side members including free end portions having extremities disposed between said primary frame side members adjacent said primary frame base, opposite end portions aligned with said free end portions, respectively, and arcuate segments between and joining said free end portions and opposite end portions, and

means pivotally joining said second frame extremities to said primary side frame members on a pivot axis parallel to said frame bases and cross-brace for rotation of said second frame between a storage position wherein said second frame portions are coplanar with and disposed within said primary frame and a use portion wherein said second frame portions are coplanar with said primary frame, said second frame segments curve about and seat against the rear side of said primary frame base, and said opposite end portions of said second frame side members rise above said primary frame base to form a luggage supporting extension of and coplanar with said primary frame.



3,947,055

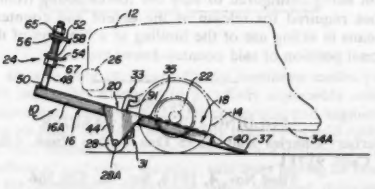
AUXILIARY UNDERCARRIAGE FOR VEHICLES

James O. Allen, 1600 W. 7th St., Peoria, Ill. 61605

Filed June 9, 1975, Ser. No. 585,017

Int. Cl.² B60S *13/00*

U.S. Cl. 280—47.15 **10 Claims**



1. An auxiliary undercarriage for vehicles having pneumatic tires rotatably mounted on axle means and having a pair of bumpers, comprising:

an elongated member for disposition under the vehicle adjacent one of the tires to help support its axle means;

wheel means mounted under said elongated member for supporting it rollably;

ramp means on the rear end portion of said elongated member for guiding the axle means to be supported upwardly therealong until the axle means is positioned above said wheel; and

clamping means on the front end portion of said elongated member for attaching releasably said elongated member to the nearest one of the pair of bumpers.

3,947,056

IMPACT-ELEMENT FOR THE PROTECTION OF THE OCCUPANT OF A VEHICLE

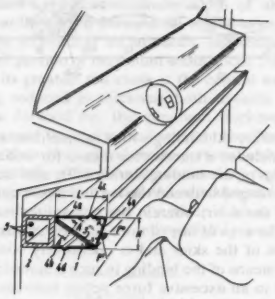
Wilfried Schwanz, Braunschweig, Germany, assignor to Volkswagenwerk AG., Wolfsburg, Germany

Filed Mar. 7, 1974, Ser. No. 448,926

Claims priority, application Germany, Mar. 12, 1973, 2312202

Int. Cl.² B60R *21/04*

U.S. Cl. 280—150 B **11 Claims**



1. A safety device for protecting an occupant of a vehicle, particularly a motor vehicle, against injury in the event of rapid deceleration of the vehicle relative to the occupant, comprising

a rigid carrier;

means for mounting said carrier in the passenger compartment of a vehicle forwardly of the position assumed by an occupant; and

a plastically deformable energy-absorbing member provided on said carrier and positioned to undergo plastic deformation upon impacting by the occupant to thereby absorb the impact energy and protect the occupant, said member being constructed in the form of a hollow body which is box-shaped in cross section and wherein there is further provided a deformation resistant, diagonally oriented cross piece in said hollow body.

3,947,057

MONITORING SYSTEM FOR A STEERING WHEEL MOUNTED AIR BAG GAS SOURCE

Gerhard Schiesterl, Stuttgart, and Helmut Wulf, Nellingen, both of Germany, assignors to Daimler-Benz AG, Germany

Division of Ser. No. 237,641, March 24, 1972, Pat. No. 3,825,278. This application June 6, 1974, Ser. No. 477,100

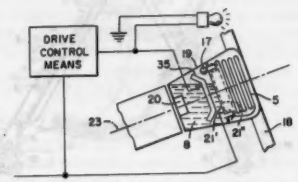
Claims priority, application Germany, Mar. 25, 1971, 2114475

Int. Cl.² B60R *21/08*; G08B *21/00*

U.S. Cl. 280—150 AB **29 Claims**

1. A passenger protective installation for vehicles, especially motor vehicles, the installation comprising: a rotatable steering spindle, a steering wheel mounted on said steering spindle, at least one inflatable air bag means, a gas producer

means operatively connected with said air bag means for inflating the same upon a predetermined deceleration of the vehicle, said gas producer means including a predetermined quantity of electrically non-conductive liquified gas, a tank means for housing said liquified gas, said tank means is arranged coaxially to the steering spindle and is rotatable in unison with the steering spindle, a float means arranged in said tank means, said float means including an electrically conductive surface, contact surface means separated from one another in said tank means, said float means being disposed between said separated contact surface means and normally



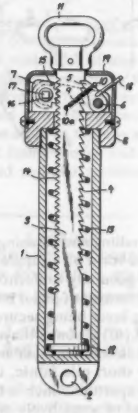
maintained out of contact with said contact surface during rotation of the steering spindle by a predetermined liquid level of said liquified gas in said tank means, said contact surface means is disposed in said tank means concentrically surrounding an axis of rotation of the steering spindle, said float means abutting at said contact surface means when the liquid level of said liquified gas in said tank means is disposed below a predetermined minimum level, and wherein circuit means including said contact surface means are provided, said circuit means further including means for monitoring the liquid level of said liquified gas, said circuit means being closed by engagement of said float means at said contact surface means.

3,947,058

SEAT-BELT RESTRAINER

Jean Andre Laporte, Les Artigues de Lussac, 33570 Lussac, France

Filed July 30, 1974, Ser. No. 493,667
Int. Cl.² B60R 21/10
U.S. Cl. 280—150 SB **2 Claims**



1. A safety-enhancing device for use in a seat-belt equipped frame of a vehicle for assuring a progressively increasing seat-belt tension in the event of a collision and a shock reduction to the user by suppressing any rear-directed user rebound comprising:

a case attached with one end to said frame and with the other end to the seat belt;

a compression spring;

a longitudinal ratchet and a pawl engageable with said ratchet, said pawl being maintained in engagement with said ratchet by the force of said compression spring, said ratchet being formed on its other longitudinal side as a rack; and

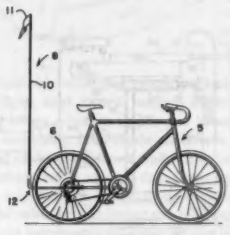
a pinion cooperating with said rack and rotatable by an external handle for repositioning said ratchet to an initial position following said collision.

3,947,059

MOUNTING BRACKET FOR BICYCLE SAFETY FLAG

Robert Lewis Gillilan, Jr., 110 Terrace Drive, Barrington, Ill. 60010

Filed Nov. 14, 1974, Ser. No. 523,561
Int. Cl.² B62J 11/00
U.S. Cl. 280—289 **2 Claims**



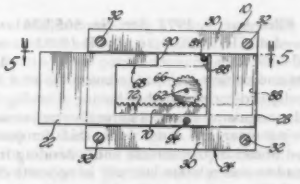
1. A mounting bracket for a bicycle safety flag wand, said bracket being formed of a rod-like or strip-like member with the distal end of one bracket leg being flat and adapted to be clamped onto one side of the rear wheel generally horizontal supporting fork of the bicycle with the bracket extending rearwardly from said distal end and having an offset therein for clearing a rear wheel de-railer associated with the rear wheel, and with the other bracket leg extending generally upwardly and having a socket formation on its upper end for receiving the bottom end of the flag wand.

3,947,060

BOLT MECHANISM WITH MANUAL OVERRIDE

Russell D. Zimmer, and William S. Traver, both of Colchester, Ill., assignors to Pulse Dynamics Manufacturing Corporation, Colchester, Ill.

Filed Feb. 26, 1975, Ser. No. 553,383
Int. Cl.² E05B 47/00
U.S. Cl. 292—142 **9 Claims**



1. A bolt mechanism comprising the combination of: a unitary bolt movable between latching and non-latching positions and being unbiased toward either position; said bolt including a pair of spaced control surfaces; a rotary DC electric motor having a rotatable shaft; a speed reduction gear drive train having an input driven by the motor shaft and an output drivingly engaged with the bolt so as to drive the bolt

from one position thereof to the other as the motor shaft rotates; control circuit means for reversing the direction the bolt is driven by the motor and gear drive train so that the bolt may be driven to either the latching or non-latching position; said control circuit means including a switch having an arm received between the control surfaces of the bolt and engaged by one of said surfaces as the bolt moves to each of its positions so as to reverse the polarity supplied to the motor by the circuit means; and slip clutch means along the path of driving engagement between the motor shaft and the bolt so the bolt is normally located in either position thereof by the motor and drive train but may be manually moved from one position thereof to the other in a manner overriding the motor and drive train.

3,947,061

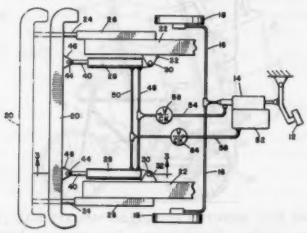
EXTENSIBLE VEHICLE BUMPER

Eugene Ellis, 202 Coast Blvd., La Jolla, Calif. 92037

Filed Feb. 28, 1975, Ser. No. 554,180

Int. Cl.² B60R *19/02*

U.S. Cl. 293—5 **4 Claims**



1. An extensible bumper for use on a vehicle having a fluid-operated brake system comprising:

a. a bumper bar;

b. a pair of fluid-operated slave cylinders mounted to a vehicle frame and having the pistons thereof connected to said bumper bar to extend same upon said cylinder being activated;

c. said cylinders having fluid connection means to the fluid system of the vehicle brake system, said fluid connection means including a valve means to permit fluid flow into said cylinders upon the existence of a predetermined threshold pressure in said fluid system, whereby upon application of a predetermined force to the vehicle brakes said bumper bar is extended.

3,947,062

VEHICLE BUMPER CONVERTIBLE TO A TOW BAR

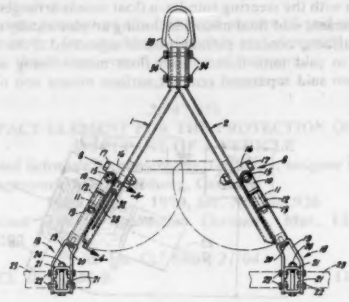
Harless Pierce, 1212 W. Longview Ave., Stockton, Calif. 95207

Filed Apr. 7, 1975, Ser. No. 565,936

Int. Cl.² B06D *1/16*; B60R *19/02*

U.S. Cl. 293—69 R **10 Claims**

1. A front-end vehicle bumper, convertible to a longitudinally forwardly projecting tow bar having a towing socket at its front end, comprising a pair of normally transverse bumper sections having inner and outer ends, said bumper sections being spaced ahead of the vehicle and extending from adjacent inner end-to-end relation laterally in opposite directions, means detachably connecting the bumper sections at said adjacent inner ends, a pair of rigid, transversely spaced, longitudinal supporting arms corresponding to the bumper sections and disposed between the latter and the front of the vehicle, means rigidly securing the supporting arms at the rear to the vehicle, normally coupled connection means including vertical axis pivotal connections between the front of the supporting arms and corresponding bumper sections at points which permit of horizontal swinging of the latter, when detached at said adjacent inner ends, from said laterally extending positions to positions in longitudinally forwardly converging relation with said outer ends then foremost and in closely adjacent relation for reception of the towing socket, and means to detachably secure the towing socket on such foremost ends.



3,947,063

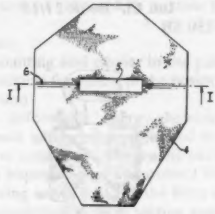
HANDLING OF PHONOGRAPH RECORDS

Robert Roland Webster, 10 Broomfield Court, Common Road, Hatfield, Hertfordshire, and David William Webster, 22 Wood Close, Hatfield, Hertfordshire, both of England

Filed Jan. 18, 1974, Ser. No. 434,518

Int. Cl.² B65G *7/12*

U.S. Cl. 294—16 **3 Claims**



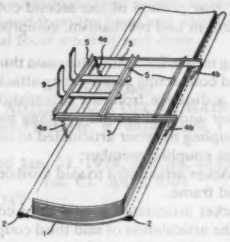
1. An article for handling and cleaning phonograph records, which article is in the form of a supple, laminated, foldable, normally flat pad of generally uniform thickness comprising (*i*) a supporting layer formed of paper board, cardboard or the like, (*ii*) a cushioning layer being secured to one face of said supporting layer, and (*iii*) a contact layer which is secured to the other face of said cushioning layer and which has a surface in the form of a soft short pile fabric, there being formed in said pad an elongate aperture which is from about 1 to about 3 inches in length and of a relatively narrow width such that part of the rim of a phonograph record can pass through said elongate aperture, said pad being readily foldable and unfoldable about a straight fold line along the longitudinal axis of said elongate aperture from a substantially planar unfolded configuration to a folded configuration in which the contact layers of adjacent areas face each other.

3,947,064

DEVICE FOR HANDLING SHEET MATERIAL

Lars-Göran Skoting, Kristinehamn, Sweden, assignor to AB Casco, Stockholm, Sweden

Filed Mar. 8, 1974, Ser. No. 449,582
Int. Cl.[2] B66C 1/16
U.S. Cl. 294—67 E 1 Claim



1. A structure for lifting and transporting a bundle of normally-flexible sheet materials, comprising;

a. a sling-type bundle support means, including; (1) a generally-rectangular, flexible sheet of material slightly larger than said bundle and (2) an elongated, rigid, rod-like member extending along and directly coupled to and supporting each of two opposed side edges of said flexible sheet;

b. a generally-flat, rigid lifting frame means having a width greater than the width of said support means from one of said rod-like members to the other when said flexible sheet is stretched flat between said rod-like members and adapted to be supported on the arms of a fork lift in a generally-horizontal plane;

c. a first set of a plurality of elongated, flexible connecting means, each of said connecting means having one end directly and fixedly attached to one of said rod-like members and the other end fixedly attached to said frame means; and

d. a second set of a plurality of elongated, flexible connecting means, each of said connecting means having one end directly and fixedly attached to the other of said rod-like members and the other end fixedly attached to said frame means;

e. the distance between the points of attachment of said first and second sets of connecting means to said frame means being greater than said width of said support means from one of said rod-like members to the other when said flexible sheet is stretched flat between said rod-like members, whereby said sets of connecting means diverge outwardly and upwardly to thereby suspend said support means below said frame means and stretch said flexible sheet between said rod-like members when said frame means is lifted.

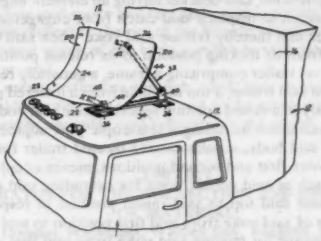
3,947,065

AIR DEFLECTOR FOR USE IN COMBINATION WITH A VEHICLE PULLING A TRAILER

Robert G. Geiger, Elkhart, Ind., assignor to Air-Flo Company, Inc., Elkhart, Ind.

Filed Oct. 2, 1974, Ser. No. 511,247
Int. Cl.[3] B60J 9/04; B62D 35/00
U.S. Cl. 296—1 S 7 Claims

1. An air deflector used in combination with a vehicle pulling a trailer, said vehicle including a roof, said trailer including a front wall located behind and extending above said vehicle roof, said deflector comprising first and second blade members each having leading and trailing edges and front and rear faces extending between said edges, said blade members being joined at their leading edges and extending divergently from said leading edges toward their trailing edges in a V-shaped configuration, said trailing edges being contained in substantially parallel longitudinally extending planes, each blade member having a concave front face with the joined leading edges of the members having a concave configuration, each blade member including upper and lower edges with the concavity thereof extending between said upper and lower edges and with the blade member being of substantially uniform concave cross section from its upper edge to its lower edge



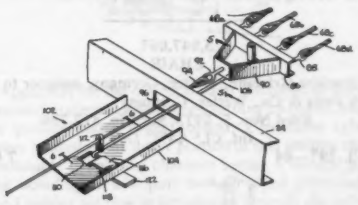
along its longitudinal dimension extending between its leading and trailing edges, said joined leading edges terminating at said upper and lower edges in upper and lower spaced points, frame means mounting said blade members to said vehicle roof in front of said trailer front wall with the lower edges of the blade members being spaced from said roof and with the joined leading edges of the blade members projecting toward the front of said vehicle, said lower spaced point being located forwardly of said upper spaced point of the blade members.

3,947,066

ROOF SAFETY LATCH

Irvin A. Nisley, Rome City, Ind., and James R. Kuhl, Sturgis, Mich., assignors to Bangor Punta Operations, Inc., Greenwich, Conn.

Filed Dec. 4, 1974, Ser. No. 529,668
Int. Cl.[2] B60P 3/34
U.S. Cl. 296—27 7 Claims



1. A travel trailer comprising a frame, a generally rectangular body on said frame, a top movable from a lowered position on said body to a raised position spaced above said body, a top raising mechanism including a telescopic post adjacent each corner of said body, a yoke carried by said trailer for movement between first and second positions, means coupling said yoke to each of said corner posts for extending said posts thereby to raise said top to said raised position in response to movement of said yoke from said first position to said second position, means for moving said yoke from said first position to said second position, said yoke moving means including a winch carried by said frame and a main cable connected between said winch and said yoke, a guideway carried by said frame, a latch for positively retaining said yoke substantially in said said position including a latching member carried by said yoke for movement therewith and having a catch, said latch member including a rod connected at one end to said

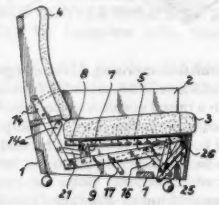
yoke and carrying said catch at the opposite end, a keeper defined by an aperture in said guideway, said catch being engageable with said keeper to retain said yoke substantially in said second position and said top in its raised position, said catch being movable along said guideway in response to movement of said yoke from said first position to said second position and movable into said aperture in response to movement of said yoke into said second position, and means for releasing said catch from engagement with said keeper, said means for releasing including a bracket movable between locking and releasing positions, said bracket having an element engageable with said catch to displace said catch from engagement with said keeper and thereby release said yoke when said bracket is moved from its locking position to its release position.

5. A travel trailer comprising a frame, a generally rectangular body on said frame, a top movable from a lowered position on said body to a raised position spaced above said body, a top raising mechanism including a telescopic post adjacent each corner of said body, a yoke carried by said trailer for movement between first and second positions, means coupling said yoke to each of said corner posts for extending said posts to thereby raise said top to said raised position in response to movement of said yoke from said first position to said second position, means for moving said yoke from said first position to said second position, said yoke moving means including a winch carried by said frame and a main cable connected between said winch and said yoke, a guideway carried by said frame, a latch for positively retaining said yoke substantially in said second position including a latching member carried by said yoke for movement therewith and having a catch, said latch member being connected at one end to said yoke and carrying said catch at the opposite end, a keeper carried by said frame, said catch being engageable with said keeper to retain said yoke substantially in said second position and said top in its raised position, said catch being movable along said guideway in response to movement of said yoke from said first position to said second position and movable into engagement with said keeper in response to movement of said yoke into said second position, and means for releasing said catch from engagement with said keeper, said means for releasing including a bracket movable between locking and releasing positions, said bracket having an element engageable with said catch to displace said catch from engagement with said keeper and thereby release said yoke when said bracket is moved from its locking position to its release position.

3,947,067
CHAIR

Hans-Joachim Griefahn, Wetter, Germany, assignor to Stanzwerk Peitz & Co., Wetter, Germany

Filed Nov. 5, 1973, Ser. No. 412,796
Int. Cl.[2] A47C 1/035
U.S. Cl. 297—84 **7 Claims**



1. In an adjustable easy chair with variable seat inclination and variable seat angle, the chair having a frame, a seat and a backrest; a mechanism interconnecting the frame, the seat and the backrest and including, on both sides of the seat, a first coupling member extending forwardly from the backrest and supporting the seat of the chair and having rear and front portions; first and second rockers pivotally attached to the first coupling member adjacent the rear and the front portions thereof, respectively; the first and second rockers extending downwardly from the first coupling member; a second coupling member disposed below and extending generally in the same direction as the first coupling member and having a rear and a front portion; the first and second rockers being articulated to the second coupling member adjacent its rear and front portions, respectively; a third rocker on which the backrest is supported having a lower end portion at which it is pivoted to the rear portion of the second coupling member; the improvement in said mechanism, comprising in combination:

a. connecting means for articulating said third rocker to said frame, said connecting means being attached to said third rocker at a distance from the articulation between said third rocker and said second coupling member;
b. a third coupling member articulated to said front portion of said first coupling member;
c. a fourth rocker articulated to said third coupling member and to said frame;
d. a fifth rocker articulated to said third coupling member between the articulation of said third coupling member to said fourth rocker and to said first coupling member, said fifth rocker further being articulated to said frame and being longer than said fourth rocker; and
e. abutment means for limiting the pivot angle of said fourth and fifth rockers at least in the rearward direction;

whereby said first coupling member, together with said seat of the chair executes no rearward motion when said third rocker, together with said backrest is moved from a substantially upright, sitting position into a more inclined, television position.

3,947,068
CHAIR

Randall P. Buhk, Wyoming, Mich., assignor to Steelcase Inc., Grand Rapids, Mich.

Filed Apr. 22, 1974, Ser. No. 463,192
Int. Cl.[2] A47C 3/00
U.S. Cl. 297—445 **17 Claims**

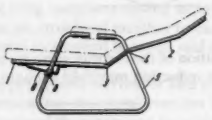
1. A chair comprising: a base; a stretcher operably mounted on said base and having one end at one side of said chair and another end at the other side of said chair; a pair of spaced side rails, one joined to said one end of said stretcher and the other joined to said other end of said stretcher, each said side rail being continuous and having a seat supporting portion and a back supporting portion; formed, plastic supporting seat and back means including an integrally formed, downwardly opening channel immediately at each side edge thereof whereby the body supporting portions of said supporting seat and back means lies entirely between said channels; said supporting seat and back means being operably connected to said side rails, with each said channel being seated over one of said side rails and generally following the contour of its respective side rail as it extends along the seat and back supporting portions of its respective side rail whereby said side rails define the contour of said chair along its side edges; formed plastic inner seat and back means having a shape conforming generally to the front

surface of said supporting seat and back means; upholstery covering means covering the face of said inner seat and back means, said upholstery covering means including upholstery wrapped around the edges of said inner seat and back means to the rear surface thereof; means securing said inner seat and back means to said supporting seat and back means; and said inner seat and back means terminating along their side edges short of and adjacent said channels whereby the presence of said side rails is accentuated and readily apparenet even when said chair is viewed from the front and whereby said side rails serve as a visual focal point of said chair.

3,947,069
ADJUSTABLE DECK-CHAIR

Ferdinand Lusch, Hochstr. 9, 4814 Senne I near Bielefeld, Germany

Filed Jan. 21, 1974, Ser. No. 435,056
Int. Cl.² A47C 1/02
U.S. Cl. 297—317 **19 Claims**

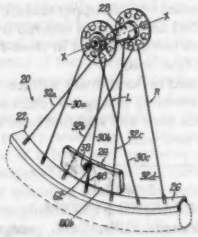


1. An adjustable deck-chair, comprising a frame having an elongated cross-bar; a seat-back assembly including a back pivoted on said frame and a seat pivotably connected to said back; and supporting means for supporting said seat on said cross-bar for movement between a forward and a retracted position, said supporting means including a friction and detent member pivotably mounted on said cross-bar for angular displacement about the same and having a passage extending transversely of the elongation of said cross-bar and offset therefrom, and a bracket connected to said seat underneath the same and slidably received in said passage in frictional contact with the surface bounding said passage for arresting of said seat in and intermediate said positions thereof.

3,947,070
BICYCLE WHEEL REFLECTOR

Frank P. Brilando, Niles; Sidney A. Heenan, Park Ridge; Rudolph L. Schwinn, Niles, and Jay S. Waxman, Skokie, all of Ill., assignors to Schwinn Bicycle Company, Chicago, Ill.

Continuation of Ser. No. 488,288, July 15, 1974, abandoned. This application Dec. 26, 1974, Ser. No. 536,623
Int. Cl.² B60B 7/00
U.S. Cl. 301—37 SA **25 Claims**



1. A bicycle wheel reflector comprising:

an elongated body extending along a central plane, said body having opposite side portions with light-reflective side surfaces on opposite sides of said plane, said body being bounded along the length thereof by a pair of marginal edges at least the outer one of which is symmetrical with respect to a radial line in said central plane;

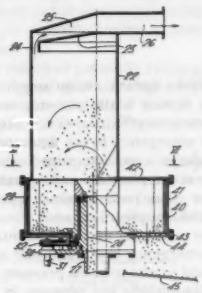
said body having a spoke-receiving groove in one of said side portions which is diagonally disposed to correspond with the angle of a spoke on a bicycle wheel both with respect to the plane of rotation of the bicycle wheel and with respect to a radial line extending from the bicycle wheel axle in said plane of rotation, enabling said body to be assembled on the bicycle wheel with said groove engaging said spoke and said body symmetrically positioned with respect to the rim of the bicycle wheel and with said central plane of the body parallel to said plane of rotation; and

bolt means extending through a bolt hole in said body for holding said spoke within said spoke-receiving groove to thereby assemble said reflector on the wheel.

3,947,071
APPARATUS FOR THE COLLECTION AND DISCHARGE OF MATERIAL

David Douglas Wightman, Whitley Bay, England, assignor to British Gas Corporation, London, England

Filed June 7, 1974, Ser. No. 477,332
Claims priority, application United Kingdom, July 19, 1973, 34461/73
Int. Cl.² B65G 53/46
U.S. Cl. 302—59 **1 Claim**



1. Apparatus for the collection and discharge of excavated, fragmented material comprising a settling chamber, having an upper portion and a lower portion, a rotatable cylindrical chamber housed in the lower portion of said settling chamber, said rotatable cylindrical chamber having a vertical axis and means including an inlet port through which entrained material and carrier air flow is introduced through the cylindrical chamber into the upper portion whereby said material is separated from said carrier air flow, the axis of said inlet port being coincident with the vertical axis of said rotatable cylindrical chamber, partition means in said cylindrical chamber to divide at least part of the cylindrical chamber into a number of compartments, means for rotating said cylindrical chamber about said vertical axis whereby said separated material is deposited in at least one of said compartments and upon rotation of the cylindrical chamber is transferred to a different location in the lower portion of the settling chamber from whence it can be discharged from the cylindrical chamber, means for reducing any tendency for the material to adhere to the partition means and an internal surface of the lower portion of the settling chamber, the upper portion of the settling chamber forming a partially cylindrical expansion chamber into which entrained air and material is delivered from said inlet port, said expansion chamber containing an outlet port and being capped by a baffle defining an air exhaust passage

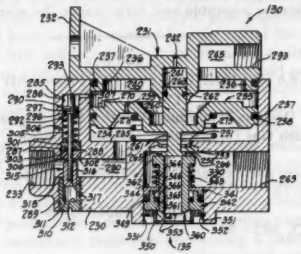
communicating with said outlet port, said partially cylindrical expansion chamber having a substantially uniform cross-section extending from the lower portion to said baffle.

3,947,072

BRAKE SYSTEM

Ronald S. Plantan, Wickliffe, Ohio, assignor to White Motor Corporation, Cleveland, Ohio

Filed Nov. 25, 1974, Ser. No. 526,478
Int. Cl.² B60T *13/36*
U.S. Cl. 303—13 **29 Claims**



25. A vehicle brake system, comprising:

a. at least one service brake actuator normally operable when pressurized to effect service brake application;

b. at least one emergency brake actuator operable when pressurized above a predetermined pressure to release emergency brake application and operable when depressurized below said predetermined pressure to effect emergency brake application; and

c. pressurization means for normally maintaining fluid pressure in said emergency brake actuator at a normal pressure above said predetermined pressure; and

d. means for diminishing the pressure in said emergency brake actuator when said service brake actuator is being pressurized to effect service brake application.

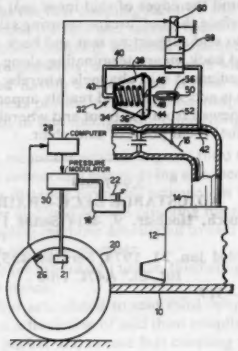
3,947,073

DEVICE FOR REDUCING THE BRAKING EFFECT OF THE ENGINE OF A MOTOR VEHICLE EQUIPPED WITH AN ANTI-SKID BRAKING SYSTEM

Maurizio Cattaneo, Turin; Armando Marchino, Cambiano (Turin), and Luigi Doano, Revigliasco d'Asti (Asti), all of Italy, assignors to Fiat Societa per Azioni, Turin, Italy

Filed June 19, 1974, Ser. No. 480,800
Claims priority, application Italy, July 23, 1973, 69197/73
Int. Cl.² B60T *8/04*
U.S. Cl. 303—21 R **4 Claims**

1. In a vehicle equipped with an internal combustion engine having at least one induction manifold connected thereto to direct fuel/air mixture into the cylinders of the engine, a throttle valve located within said manifold for regulating the air flow therein, and an anti-skid braking system connected to the wheels of the vehicle, the improvement which comprises throttle control means connected to and controlled by the anti-skid braking system, said throttle control means including an actuator connected to the throttle valve, and also connected to the induction manifold said throttle control means being effective to cause the opening of the throttle valve when the anti-skid braking system commences operation, and



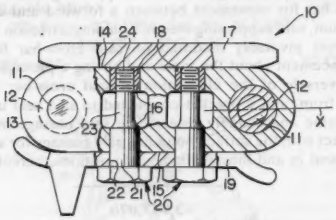
wherein the position of the throttle valve is varied, through the actuator, by the induction manifold vacuum.

3,947,074

REVERSIBLE TRACK LINK WITH REPLACEABLE RAIL AND METHOD

David V. Nelson, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 27, 1975, Ser. No. 544,085
Int. Cl.² B62D *55/20*
U.S. Cl. 305—54 **9 Claims**



1. A track link assembly for an endless track assembly of a track type vehicle comprising:

a track link defining upper and lower surfaces thereon and means defining at least one first bore transversely through said track link in intersecting relationship with the upper and lower surfaces thereof;

a rail segment disposed on said upper surface and having an internally threaded annular boss secured on an underside thereof, said boss being disposed in close-fitting relationship within said first bore;

a track shoe disposed on said lower surface; and

fastening means extending in aligned relationship upwardly through said track shoe and said first bore and threadably attached within said boss.

3,947,075

BEARING SYSTEM

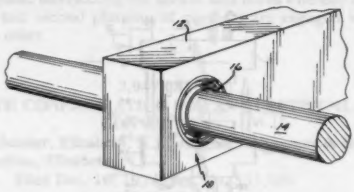
Hans P. Ewertz, Granada Hills, Calif., assignor to Valley-Todeco, Inc., Sylmar, Calif.

Filed Nov. 4, 1974, Ser. No. 520,274
Int. Cl.² F46C *23/04*
U.S. Cl. 308—72 **9 Claims**

1. A bearing system comprising in combination,

a spherical bearing having a ball member formed with a pair of oppositely disposed substantially flat side walls and a race member formed complementally of said ball member and having a slot for receiving the same,

the width of said ball member as defined by said opposite side walls corresponds to the slot in said race member to enable said ball member to pass through said slot for insertion and removal of said bearing member relative to said race member,



each of said bearing members having adapted for connection to a separate structural member to cause said bearing to afford pivotal movement between said structural members,

and means interposed between one of said bearing members and its corresponding structural member to permit reciprocatory movement therebetween for varying the point of pivotal movement between said structural members.

3,947,076

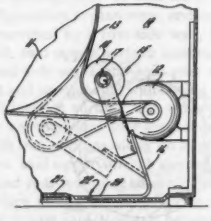
LUBRICATING BEARING AND BRACKET MOUNTING

Richard Jay Lindeman, Elmwood Park, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Dec. 19, 1974, Ser. No. 534,267

Int. Cl.² F16C *1/24*, *13/02*, *33/66*; **F16H** *55/36*

U.S. Cl. 308—103 **7 Claims**



1. A fixed bearing for rotatably supporting a pulley and lubricated bushing or the like, comprising a bi-ended, hollow cylindrical tube slit from an outer surface to an inner surface and from one end to the other in a direction parallel to the tube axis to form generally opposed lips, at least a portion of one lip being connected to an axially extending flange means which is disposed inwardly from said lip in chordal relationship to the balance of the bearing, the free edge of said flange means extending inwardly more than the radial distance between the inner and outer surfaces of said hollow bearing to catch oil drippings and return them to the pulley bushing.

5. An idler pulley assembly for the complimental biasing and acceptance of a belt, said assembly comprising a spring urged bearing support fork, a bearing mounted on the support fork, means for orienting said bearing relative to said support fork, and a complimentary pulley wheel journalled on the bearing, the bearing included a bi-ended, hollow cylindrical tube slit from an outer surface to an inner surface and from one end to the other in a direction parallel to the tube axis to form generally opposed circumferentially spaced lips, at least a portion of one lip being connected to axially extending flange means which is disposed inwardly from said lip in chordal relationship to the balance of the bearing, the free edge of said flange means extending inwardly more than the radial distance between the inner and outer surfaces of said hollow bearing to catch oil drippings from said pulley and return them to the pulley.

3,947,077

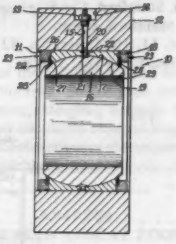
SEALED BALL AND SOCKET CONNECTION

Lawrance F. Berg, Lockport, and Peter F. M. Prillinger, Decatur, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 352,502, April 18, 1973, Pat. No. 3,873,166. This application Sept. 23, 1974, Ser. No. 508,501

Int. Cl.² F16C *1/24*

U.S. Cl. 308—187.1 **2 Claims**



1. A combined sealing and retaining means adapted for use in a sealed ball and socket connection comprising

an annular rigid retainer having a generally rectangular cross section,

annular recess means of generally rectangular cross section formed on only one axial side and radially inner corner of said retainer to extend to a limited and substantially constant depth axially in said retainer and radially downwardly thereon and

an annular elastomeric lip seal constituting an upper portion secured in said recess means and substantially conforming to the shape thereof and a flexible lip extending radially downwardly from said upper portion and below said retainer.

3,947,078

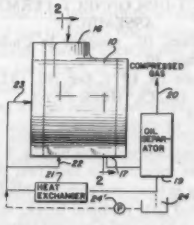
ROTARY SCREW MACHINE WITH ROTOR THRUST LOAD BALANCING

Oleif Olsaker, Michigan City, Ind., assignor to Sullair Corporation, Michigan City, Ind.

Filed Apr. 24, 1975, Ser. No. 571,472

Int. Cl.² F16C *13/00*

U.S. Cl. 308—207 R **18 Claims**



1. A bearing assembly for the rotors of a rotary screw gas machine having a housing with a low pressure port at one end and a high pressure port at the other, main and gate rotors having shafts on which the rotors are mounted for rotation in the housing, the rotors having meshing spiral lobes and

grooves which trap gas while moving it between the ports, the rotor being subject to a low radial load at the low pressure end, a high radial load at the high pressure end and to an axial load urging the rotors toward the low pressure end, said bearing assembly including:

a pair of axially opposed thrust and high radial load bearings between each rotor shaft and the housing at the high pressure end;

a high thrust bearing between each rotor shaft and the housing at the low pressure end; and

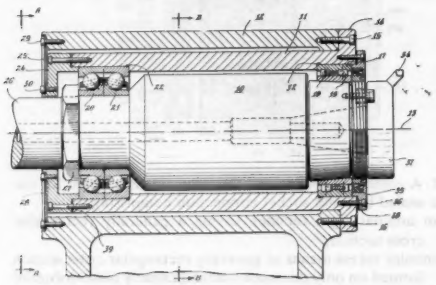
means for applying an axial force to the rotors tending to equalize the thrust load on the opposed thrust bearings at the high pressure end.

3,947,079

TEMPERATURE COMPENSATED SPINDLE

Warren D. Anderson, Stamford, Conn., assignor to FAG Bearings Corporation, Stamford, Conn.

Filed Nov. 11, 1974, Ser. No. 522,472
Int. Cl.² F16C *35/08*
U.S. Cl. 308—228 **5 Claims**



1. A rotatable spindle support for a machine tool comprising in combination a rigid machine frame, a cylindrical housing enclosing the spindle and securely mounted to said frame at the working end of the spindle, a floating bearing mounted in said housing and radially supporting the spindle at its working end, said floating bearing comprising a large number of small diameter roller bearings supporting a large diameter portion of the spindle working end, a fixed bearing mounted in said housing at the opposite end thereof comprising a preloaded duplex pair of angular contact ball bearings supporting a smaller diameter portion of the spindle shaft at its driven end, and axially flexible mounting means securing said housing to said frame at the driven end of the spindle, whereby the spindle and said housing are free to expand axially at the driven end while remaining axially fixed at the working end.

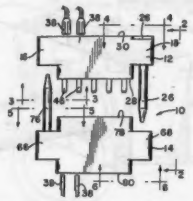
3,947,080

QUICK-CONNECT-DISCONNECT TERMINAL BLOCK ASSEMBLY

Hans Ege, Des Plaines, Ill., assignor to Underwriters Safety Device Co., Chicago, Ill.

Filed June 14, 1971, Ser. No. 152,794
Int. Cl.² H01R *13/62*
U.S. Cl. 339—64 M **9 Claims**

1. A quick-connect-disconnect terminal block assembly including first and second terminal blocks, a plurality of first terminal connectors mounted in said first block with each connector including at least one terminal blade which extends from one side of said first terminal block, said first terminal connector includes a base and a second terminal blade which forms means for receiving and holding a female quick-connect terminal connector thereon, said first block has a plurality of holes therein and each of said holes includes a first portion extending into said first block from said one side thereof and having a cross section substantially equal to the cross section of said base of one of said first terminal connectors and a second portion which extends nto said first block from another side thereof and which is large enough to receive a female quick-connect terminal connector, said base of each of said first connectors being received in said first portion of one of said holes and said second terminal blade of each of said first connectors being located in said second portion of one of said holes, a plurality of second terminal connectors mounted in said second block with each of said second connectors



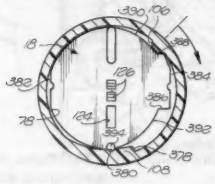
including a female jack portion which is recessed in said second block, each of said female jack portions being located in a predetermined manner for receiving and frictionally holding one of said terminal blades extending from said one side of said first terminal block to form releasable individual electrical connections between each one of said first connectors and one of said second connectors, each of said terminal connectors including means for receiving and holding a female quick-connect terminal connector thereon.

3,947,081

LOW INSERTION FORCE CIRCULAR ELECTRICAL CONNECTOR

Carl W. Peterson, Santa Ana, Calif., assignor to International Telephone & Telegraph Corporation, New York, N.Y.

Filed Nov. 11, 1974, Ser. No. 522,442
Int. Cl.² H01R *13/54*
U.S. Cl. 339—75 M **5 Claims**



1. A low insertion force electrical connector comprising:

a first connector member having a first plurality of contacts mounted therein;

a second connector member having a second plurality of contacts mounted therein for electrical engagement with said first plurality of contacts subsequent to mating of said first and second connector members;

said second connector member comprising a stationary insulator and a movable contact activating element, said activating element being formed wit an arcuate surface thereon, said arcuate surface gradually radially decreasing to a generally radially extending shoulder, said insulator and activating element having a plurality of axially aligned bores receiving said second plurality of contacts therein;

a rotatable shell element surrounding said activating element and having an arcuate surface therein generally complementary to said activating element arcuate surface and positioned adjacent thereto prior to engagement of said first and second plurality of contacts, said shell ele-

ment having a radially extending shoulder thereon abutting said activating element shoulder;

a rotatable bearing in one of said elements projecting beyond its arcuate surface for rolling engagement with the arcuate surface on the other element;

a notch in said other element arcuate surface receiving said bearing when said shell element is rotated a predetermined distance relative to said activating element in the direction causing separation of said shoulders, such rotation of said shell element shifting said activating element in a plane intersecting the axes of said bores whereby said first and second plurality of contacts are engaged with each other.

3,947,082

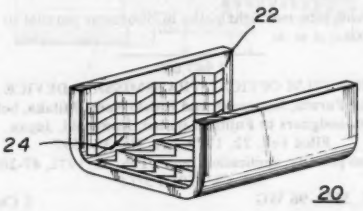
TOOTH CONFIGURATION FOR AN ELECTRICAL CONNECTOR

Louis R. Bender, Elizabeth, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Dec. 16, 1974, Ser. No. 533,209

Int. Cl.² H01R *9/08*

U.S. Cl. 339—97 R **8 Claims**



1. In an electrical connector of the type having a wire receiving portion having an interior surface, and a plurality of upstanding teeth disposed over said interior surface, the improvement comprising: each of said teeth having a generally V-shaped configuration in plan view, and comprising an upper surface circumscribed by a first side wall, a second side wall, and a rear wall, said upper surface communicating with said first and second side walls and said rear wall along a sharp edge, said first and second side walls being disposed generally normal to said interior surface and at an oblique angle with respect to one another, said first and second side walls communicating with one another along an edge defining the apex of said V-shape, said upper surface sloping downwardly from said apex to said rear wall and towards said interior surface, said upper surface having a generally concave curvature in a plan extending across said V-shape between the terminating ends of said first and said second side walls.

3,947,083

EDGE CONTACT

Kamal Ahmed, Stanmore, and Colin David Kindell, Bushey, both of England, assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 2, 1975, Ser. No. 538,235

Claims priority, application United Kingdom, Jan. 26, 1974, 3714/74

Int. Cl.² H01R *11/22*

U.S. Cl. 339—258 P **4 Claims**

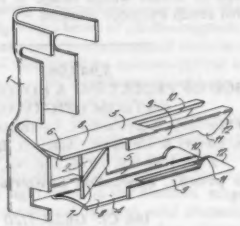
1. An electrical contactor, comprising

a pair of spaced parallel opposed arms,

said arms each having a planar section at the rear end thereof and having a channel shaped section at the front end with the sides of the channel shaped section of one arm extending toward the corresponding sides of the channel shaped section of the other arm,

a planar web element adjacent the planar section and normal thereto connecting the side of the channel shaped section of one arm to the corresponding side of the channel shaped section of the other arm,

the end of each arm distal of the web element having a longitudinal slot extending inwardly from the free end thereof intermediate the sides of the channel shaped sections,



each of the sides of the channel shaped sections being provided adjacent the front end of each arm with a protruding contact portion extending towards that of the corresponding sides of the other channel shaped section,

whereby the sides of the channel shaped sections of one arm are individually yieldable toward those of the other arm.

3,947,084

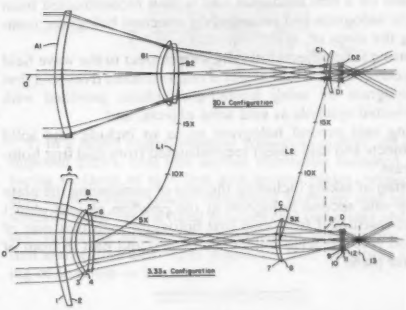
LONG-WAVE INFRARED AFOCAL ZOOM TELESCOPE

Gary R. Noyes, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Feb. 28, 1975, Ser. No. 554,272

Int. Cl.² G02B *15/16*

U.S. Cl. 350—2 **17 Claims**



1. In an afocal zoom lens attachment of variable magnification use with a prime imaging lens of fixed focal length, the improvement comprising:

a. four optically coacting lens groups arranged sequentially along an optical axis to form a non-Galilean mechanically compensated zoom system, each of said groups comprising at least one lens, each of said lenses having a useful spectral bandpass in the infared wavelength region, the first group being a fixed focus front objective element, the second group being a zooming element moving in a first locus, the third group being a zooming element moving in a second locus, and the fourth group being a fixed focus eyepiece element;

b. means to continuously vary the magnification of said system between minimum and maximum limits comprising means to simultaneously move said second and third group zooming elements through predetermined loci having a predetermined relationship to each other, one of said loci being substantially linear and the other of said loci being nonlinear; and,

c. said four groups of lenses when said second and third group zooming elements are positioned to produce said minimum magnification of said system being arranged in relation to each other so that said first, second and third groups of lenses produce a real aerial image at a first intermediate image plane between said third and fourth groups of lenses which image is recollimated by said fourth group eyepiece element.

3,947,085

METHOD OF PRODUCING A HOLOGRAM WITH AN ORTHOSCOPIC IMAGE

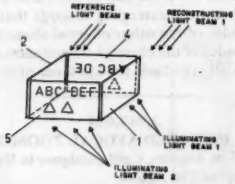
Francois Mottier, Oberrohrdorf, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Nov. 19, 1974, Ser. No. 525,066

Claims priority, application Switzerland, Dec. 21, 1973, 18013/73

Int. Cl.² G03H *1/20*

U.S. Cl. 350—3.5 **2 Claims**



1. A method of producing a hologram with an orthoscopic at least partially real image of an object, wherein the object is recorded on a first hologram and is then reconstructed from this first hologram and recorded on a second hologram, comprising the steps of:

situating solid objects laterally with respect to the wave field produced when said object is reconstructed from said first hologram by using frosted-glass plates provided with selected symbols as said solid objects, and,

taking said second hologram so as to include said solid objects and said object reconstructed from said first hologram,

the step of taking including the step of positioning the plate for said second hologram at the position of said object reconstructed from said first hologram such that part of said reconstructed object lies behind and part in front of said plate.

3,947,086

DEVICE FOR TILTING A FIELD IN AN OPTICAL SYSTEM

Jean-Jacques Hunzinger, Paris, France, assignor to U.S. Philips Corporation, New York, N.Y.

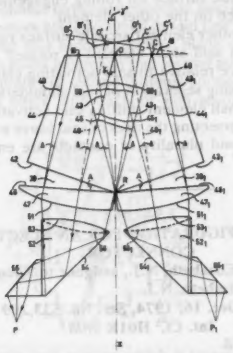
Filed Dec. 9, 1974, Ser. No. 531,085

Claims priority, application France, Dec. 13, 1973, 73.44573

Int. Cl.² G02B *21/20, 23/00, 5/04*

U.S. Cl. 350—36 **7 Claims**

1. A binocular viewing system for imaging a remote object comprising a first prism having a first planar surface receiving radiation directly from said object and having two further planar surfaces, the planes of the two further planar surfaces intersecting at a central line parallel to said first planar surface, said second surfaces being equiangularly arranged about a line, hereinafter referred to as the optic axis, perpendicular to said central line and to said first planar surface, a pair of second prisms symmetrically arranged about said central line and confronting said second surfaces of said first prism, a pair of plano convex objective lenses confronting sides of said pair of second prisms remote from said first prism, and an assembly of third prism means for directing radiation passing through



said lenses into two light paths in directions parallel to said optic axis.

3,947,087

THIN FILM OPTICAL TRANSMISSION DEVICE

Hirosuke Furuta, Kawasaki, and Hideki Noda, Mitaka, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

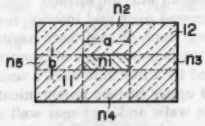
Filed Feb. 22, 1973, Ser. No. 334,597

Claims priority, application Japan, Feb. 28, 1972, 47-20722

Int. Cl.² G02B *5/14*

U.S. Cl. 350—96 WG **5 Claims**

PRIOR ART



1. Radiation transmission apparatus comprising:

a dielectric substrate having a first refractive index;

a dielectric thin film disposed upon said dielectric substrate and having a second refractive index greater than said first refractive index; and

a dielectric layer of a desired pattern disposed on said dielectric thin film, said dielectric layer having a third refractive index less than said second refractive index and having smaller lateral dimension than said dielectric thin film, and a covering layer disposed on said dielectric thin film and on said dielectric layer of the desired pattern disposed on said dielectric thin film, and having a fourth refractive index less than said third refractive index, whereby radiation is transmitted mainly in that portion of said dielectric thin film underlying said dielectric layer.

3,947,088

INTERFACE FOR LIGHT PROBE

Park French, Aurora, Ohio, assignor to Weber Dental Manufacturing Co., Canton, Ohio

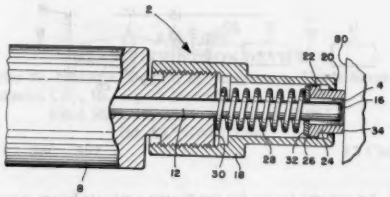
Filed Aug. 22, 1974, Ser. No. 499,491

Int. Cl.² G02B *5/14*; G01J *3/48*; G01N *21/48*

U.S. Cl. 350—96 C **1 Claim**

1. A light probe for conducting light relative to a sample, comprising a light conducting member having a rigid solid end portion from which incident light may be directed toward and light may be received from such a sample, and a liquid interface means for optically coupling said member to such sample, said liquid interface means being directly engaged with both such sample and said solid end portion when the latter is urged

toward abutment with such sample, said liquid interface means comprising clear light transmissive material applied to said rigid solid end portion of said light conducting member and forming a coating on said rigid solid end portion, and further comprising an opaque housing longitudinally enclosing at least a portion of said light conducting member proximate said rigid solid end portion, and reservoir means for containing said material, said housing comprising a portion positionally fixed with respect to said light conducting member and said reservoir means comprising an opaque movable collar retained by said housing and movable with respect to the same



and the light conducting member, said collar having a forward end and means for urging said collar to a position with respect to said housing and light conducting member such that such forward end normally is located beyond said rigid solid end portion, whereby when said light probe is directed with respect to such sample to place said solid end portion of said light conducting member toward engagement with such sample, the forward end of the collar abuts the sample forming a light seal therewith while the collar is moved inwardly of said housing and said material provides an interface between said rigid solid end portion and such sample.

3,947,089
LEAD-BISMUTH GLASSES FOR ACOUSTOOPTIC AND MAGNETOOPTIC DEVICES

James E. Rapp, Oregon, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed May 5, 1975, Ser. No. 574,381
Int. Cl.² C03C 3/12; G02B 1/00
U.S. Cl. 350—151 **12 Claims**

1. A homogeneous glass composition having an index of refraction of at least about 2.1, a longitudinal sound velocity of less than about 4 mm/μsec, an acoustic loss of less than about 6 db/cm at 20 MHz, a Verdet constant greater than about 0.10 min/Oe-cm at 0.63μm and an optical loss of less than about 10% cm when measured at a wavelength between 1 and 2μm said glass consisting essentially of:

Composition	Mole %
GeO_2	5–32
B_2O_3	1.5–18
PbO	30–60
Bi_2O_3	10–41

wherein:

$$Bi_2O_3+PbO \geq 65\% \text{ mole}$$

and

$$1 \leq \frac{PbO}{Bi_2O_3} \leq 6.$$

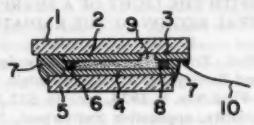
5. In a device for the acousto-optical modulation of a beam of electromagnetic radiation comprising a glass element, means for propagating longitudinal sonic wave through said element in a propagating a beam of electromagnetic radiation through said element in a predetermined direction so as to cause deflection of said beam by acousto-optical interaction with the sonic waves, the improvement wherein said glass element has the composition of claim 1.

9. In a Faraday rotator comprising a light rotating glass element, means for directing a beam of polarized light through said element, means for impressing a magnetic field on said element, said field having a component in the direction of propagation of the light through the element, means for detecting the light transmitted through said element, the improvement wherein said light rotating glass element has the composition of claim 1.

3,947,090
ELECTRO-OPTICAL DEVICES

Masachika Yaguchi, Yokohama, and Shigetaro Furuta, Fujisawa, both of Japan, assignors to Dai Nippon Toryo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 281,093, Aug. 16, 1972, abandoned. This application Aug. 19, 1974, Ser. No. 498,339
Claims priority, application Japan, Aug. 18, 1971, 46-62343; Oct. 7, 1971, 46-78324; Jan. 24, 1972, 47-9524; Feb. 26, 1972, 47-23068
Int. Cl.² G02F 1/13
U.S. Cl. 350—160 LC **1 Claim**



1. In a liquid crystal element consisting of first and second opposed plates, first and second electrodes mounted on the facing surfaces of said first and second plates, respectively, and an insulating spacer interposed between said plates, a nematic liquid crystal filled between said two plates and within said insulating spacer, the improvement wherein one of said first and second electrodes is selected from the group consisting of titanium or zirconium.

3,947,091
REFLECTIVE DISPLAY APPARATUS

James S. Trcka, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sept. 19, 1974, Ser. No. 507,504
Int. Cl.² G02F 1/13
U.S. Cl. 350—160 LC **9 Claims**

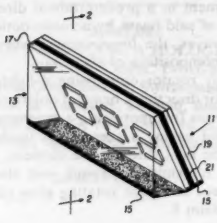
1. A reflective type display apparatus comprising:

a. display means having transparent areas and areas capable of light scattering, said areas together defining indicia to be displayed;

b. light reflective means disposed at the back of said display means;

c. transparent light refracting means disposed at the front of said display means and providing a transparent region between said display means and an observer wherein the index of refraction is greater than that of the environmental medium in which the display is operating, said transparent light refracting means configured to include (i) a rear surface in juxtaposition with said display means, and (ii) a front surface nonparallel to said rear surface; and

d. light absorptive means disposed continuously along a path between said front surface and said display means up to and touching said light reflective means, whereby substantially no light can enter the apparatus except from the front surface of said transparent light refracting means; said light absorptive means further disposed relative to said front surface such that at least some specularly reflected rays propagating from said transparent areas are routed to said absorptive means only after internal reflection from said front surface, whereby said front surface is employed to provide an image of, and extend the effect of, said absorptive means.



3,947,092
OPTICAL ARRANGEMENT FOR ILLUMINATING AN OBJECT WITH THE LIGHT OF A SHARPLY LIMITED SPECTRAL REGION OF THE RADIATION OF A LUMINOUS SOURCE

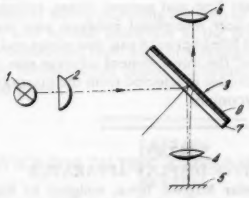
Hermann Flad, Triesen, Liechtenstein, assignor to Balzers Patent- und Beteiligungs AG, Liechtenstein

Filed Nov. 8, 1974, Ser. No. 522,314

Claims priority, application Switzerland, Nov. 12, 1973, 015833/73

Int. Cl.² G02B 27/14

U.S. Cl. 350—171 **2 Claims**



1. A light beam splitter comprising a light transmissive colored glass support having one side exposed to light rays for passage of the rays therethrough and an opposite side, a multilayer interference coating applied to said light transmissive support opposite side and comprising a system of a plurality of alternately arranged highly refractory and low refraction layers having thicknesses which are dimensioned so that there are two adjacent filter spectral region working ranges, one of said ranges which is at the short side being transmitted and another range which is at the long side of the spectral range being reflected, said support having an absorption edge spectrally limiting the reflection of said system at the short wave side, said interference coating having a ratio of optical thickness of the low refraction to the highly refractory layers of from 1 to 2 up to 1 to 9 .

3,947,093
OPTICAL DEVICE FOR PRODUCING A MINUTE LIGHT BEAM

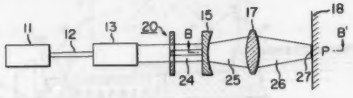
Takeshi Goshima, Tokyo, and Kiyonobu Endo, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed June 26, 1974, Ser. No. 483,406

Claims priority, application Japan, June 28, 1973, 48-72287; July 13, 1973, 48-78409

Int. Cl.² G02B 13/18, 17/08

U.S. Cl. 350—189 **9 Claims**



1. An optical device for producing a minute beam, comprising:

means for producing a beam;

means for forming the beam produced by said beam producing means into a beam of an oval annular cross-section;

means for condensing the oval annular beam formed by said beam forming means, onto a focal plane thereof to form a linear image thereon having a substantially uniform distribution of light energy along its length.

3,947,094
RETRO-TELECENTRIC LENS

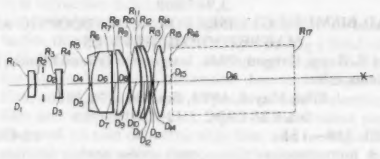
Keiji Ikemori, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 11, 1974, Ser. No. 450,237

Claims priority, application Japan, Mar. 15, 1973, 48-30428

Int. Cl.² G02B 9/64, 13/22

U.S. Cl. 350—214 **2 Claims**



1. A retro-telecentric lens comprising a divergent lens group at an object side and a convergent lens group having a plurality of lenses at an image plane side, wherein the back focus of the total lens is longer than the focal distance and the aperture almost coincides with the position of the focal point at the object side, and wherein an optical member consisting of a plural number of lenses having different dispersion for correcting coma aberration is positioned between said divergent lens group and the convergent lens group and wherein said optical member includes two lenses and the adjoining surface of said lenses is convex at an object side, and both lenses are cemented together and wherein a positive lens element is arranged at the nearest position to said optical member within said convergent lens group and wherein said optical member satisfies the following equations:

$$0.1f \leq d \leq 0.5f$$

$$-\frac{0.25}{f} \leq \phi \leq \frac{0.1}{f}$$

$$\frac{-0.0032}{f} \leq \frac{\phi_1}{\nu_1} + \frac{\phi_2}{\nu_2} \leq \frac{0.014}{f}$$

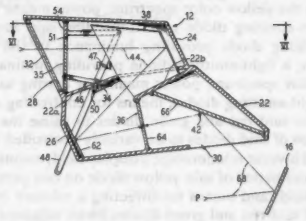
wherein d is synthesized thickness on axis of said optical member, ϕ is a synthesized power of the member, ϕ_1 is the power of a front lens system which forms the member, ν_1 is its Abbe number, ϕ_2 is the power of a rear lens system which forms the member, ν_2 is its Abbe number, and f is the focal distance of the total lens system.

3,947,095

REAR VIEW VISION DEVICE

Charles W. Moultrie, Dolton, Ill., assignor to Marie Saratore, Calumet City, Ill., a part interest

Filed Mar. 18, 1974, Ser. No. 452,061
Int. Cl.² G02B 5/08
U.S. Cl. 350—302 **12 Claims**



1. A compact periscopic device for vehicular rear vision comprising:

a housing mounted in a vehicle roof with an image receiving opening therein directed rearwardly and extending above the roof, and having an image viewing opening therein directed generally downward inside the vehicle;

a transparent seal extending over said image receiving opening;

an angularly movable objective lens having a selected focal length angularly movable into and out of the path of light through said image receiving opening;

a screen adapted to accommodate an image to be focused thereon by said lens and positioned in said housing for viewing through said image viewing opening;

a second objective lens having a different focal length than the focal length of said first lens and angularly movable into and out of the path of light alternately of said first lens and adapted to focus an image on said screen as said first lens is out of position to focus an image on said screen;

a plurality of image reflecting surfaces positioned in said housing and adapted to direct the image along a path through a series of direction changing reversals between said image receiving opening and said image viewing opening and including means to correct for optical reversal and means to correct for optical inversion of the image, comprising a pair of image reversing mirrors disposed in angular relation with respect to each other and generally facing each other and converging to an apex in the image path of said transparent seal, and a mirror spaced beneath and downstream of the image path reflected by said mirrors to correct for optical inversion, said screen being in the path of said image through said image reversing mirrors, and said image inversion mirror, said image inversion mirror being downstream of said screen and directing the image through said image viewing opening;

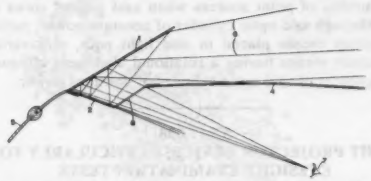
one of said objective lenses being upstream of said image reversing mirrors and the other of said objective lenses being downstream of said image reversing mirrors and means selectively moving said lenses into and out of the path of light through said image receiving opening alternately of each other.

3,947,096

REAR-VIEW MIRROR SYSTEM FOR ROAD VEHICLES

Archibald Sargeant, Felpham, England, assignor to Wingard Limited, Chichester, England

Filed Dec. 23, 1974, Ser. No. 535,508
Int. Cl.² G02B 5/08, 17/00
U.S. Cl. 350—302 **5 Claims**



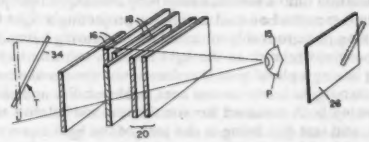
1. In combination with a road vehicle having a roof and a windshield, a rear view mirror system comprising first and second cooperating flat mirrors, means for supporting one of said mirrors from a line in or on the vehicle roof adjacent said windshield so that the mirror extends rearwardly and upwardly at an acute angle to the horizontal and in a position that at least a part of said mirror adjacent said line may be viewed by the driver of said vehicle, and means for supporting said second mirror from said line so that it extends rearwardly and downwardly at an acute angle to the horizontal from said line and in a position that an image received by said first mirror can be viewed by said driver in said first mirror after reflection on to said second mirror and back on to said first mirror.

3,947,097

PROCESS AND APPARATUS FOR ASTIGMATIC AND SPHERICAL SUBJECTIVE TESTING OF THE EYE

William E. Humphrey, Oakland, Calif., assignor to Humphrey Instruments, Inc., Berkeley, Calif.

Filed Mar. 18, 1974, Ser. No. 452,232
Int. Cl.² A61B 3/02
U.S. Cl. 351—17 **23 Claims**



1. A process for determining optometric prescription for the eye including the steps of: providing a patient viewing station; providing at least one first straight line target of first arbitrary preselected angular alignment without regard to any suspected principal axis of the patient's eye to a view path from said patient viewing station; providing in said view path variable spherical optics to vary the spherical correction of said target as viewed by said patient; varying the spherical correction responsive to subjective patient visual acuity of said first straight line target; providing in said view path first variable astigmatic optics for varying astigmatic lens power along first

intersecting diagonals at substantially equal and opposite angles from the preselected angular alignment of said first straight line target; said first variable astigmatic optics varying said astigmatic power from positive to negative along one axis of said first intersecting diagonals and from negative to positive along the other axis of said first intersecting diagonals; and, varying the first variable astigmatic optic responsive to subjective patient visual acuity of said first target to obtain a first component of astigmatic prescription for each patient.

22. An apparatus for determining astigmatism, said apparatus comprising: a patient viewing station; a target including a plurality of point sources; a light path between said patient viewing station and target; and optic cylinder of constant power rotationally aligned to an arbitrary preselected axial rotation transverse of said light path without regard to any suspected principal axis of the patient's eye, said cylinder power in the range of 4 and 20 diopters and said optic cylinder of constant power producing a plurality of line targets from said plurality of point sources when said patient views said target through said optic cylinder of constant power; variable astigmatism means placed in said light path, said variable astigmatism means having a rotational alignment oblique to the alignment of said optic cylinder of constant power.

3,947,098

LIGHT PROJECTOR DEVICE, PARTICULARLY FOR EYESIGHT EXAMINATION TESTS

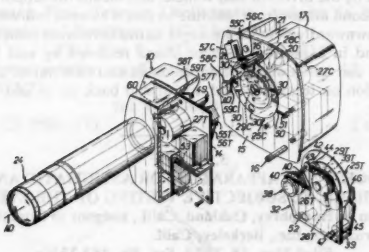
Pierre Charles Paget, Ligny-en-Barrois, France, assignor to Essilor International "Compagnie Generale d'Optique", Joinville, France

Filed June 24, 1974, Ser. No. 482,566

Claims priority, application France, June 29, 1973, 73.23859

Int. Cl.² A61B *3/02;* **G03B** *23/10*

U.S. Cl. 351—30 **18 Claims**



1. A device for projecting images such as tests for eyesight examination onto a screen, comprising a casing, a light projection unit mounted on said casing for projecting a light beam, a rocking plate rockably mounted on said casing between two end positions relative to the light beam, a test disc including a ring having a plurality of translucent test areas and a test dial also carrying at least one test area, said test disc and said test dial being both mounted for rotation on and relative to said plate, said test disc being in the path of the light beam in said first end position of said plate and the axis of rotation of said test dial substantially coinciding with the axis of the light beam in said second end position of said plate, a mask disc including a ring having a plurality of light passages mounted for rotation in said casing and disposed along the path of the light beam axially spaced from said rocking plate, said light passages on said mask disc being individually superpositionable on at least some of the test areas of said test disc in said first position, a separate motor for rotating each of said discs about its axis of rotation, drive means fixed relative to said rocking plate and driven by the motor associated with said test disc, said drive being in operative engagement with said disc to rotate said test disc when said rocking plate is in said first position and in operative engagement with said test dial to rotate said test dial when said plate is in said second position.

3,947,099

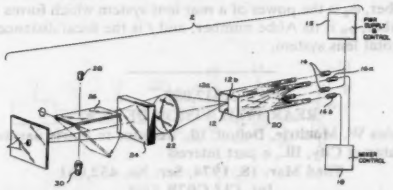
SOLID STATE COLOR ANOMALOSCOPE

Bernard Grolman, Worcester, and Robert G. Lavallee, Ashland, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Jan. 2, 1975, Ser. No. 538,229

Int. Cl.² A61B *3/06;* **G02B** *5/16*

U.S. Cl. 351—35 **4 Claims**



1. Apparatus for evaluating a human subject's color vision response comprising: a light-emittion diode providing luminance in the yellow color spectrum; power means for driving said light-emitting diode and controlling said luminance; a light-emitting diode providing luminance in the red color spectrum; a light-emitting diode providing luminance in the green color spectrum; power means for driving said red and green light-emitting diodes; means for controlling said power means for said red and green diodes to cause the individual luminance of said diodes to be variably controlled in a predetermined inverse relationship; a display field; means for directing the luminance of said yellow diode on one portion of said display field; and means for directing a mixture of the luminance of said red and green diodes on an adjacent portion of said display field, whereby said human subject may observe and compare the displayed luminance of said yellow diode to said mixed luminance of said red and green diodes.

3,947,100

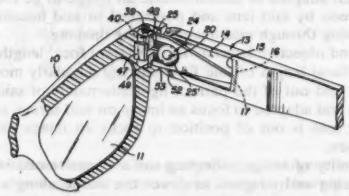
EYEGLASS FRAME

Alfred Vischer, Jr., 6111 San Marino Drive, Tucson, Ariz. 85715

Filed Apr. 22, 1974, Ser. No. 462,626

Int. Cl.² G02C *5/22, 5/14*

U.S. Cl. 351—120 **9 Claims**



1. An eyeglass construction, comprising

a lens frame having near one end thereof an elongated recess defined by a semicylindrical wall and transverse end walls,

a flexible hinge piece having a generally cylindrical forward portion disposed in said recess with the top and bottom ends thereof lying respectively adjacent said transverse end walls,

said top and bottom ends and said transverse end walls having mutually complementary interfitting pintles and recesses for holding said hinge piece in assembled relationship with said lens frame,

said hinge piece having a rearwardly extending flat portion provided with a hole therethrough,

a temple member,

means extending through said hole into said temple member for pivotally securing said temple member to said hinge piece,

said hinge piece being provided with a slot extending from said hole to the forward end of said hinge piece thereby splitting said cylindrical forward portion into spaced apart axially aligned cylindrical portions to ease insertion of said portions into said recess; and

a flexible tongue extending rearwardly from said lens frame engaging said cylindrical forward portion of said hinge piece,

said tongue being resiliently biased against said cylindrical forward portion.

3,947,101

MECHANICAL DRIVE ARRANGEMENTS

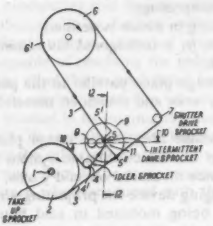
Leroy Gordon Osborn, Mill Hill, and George Hunnam Brownlee, Harrow, both of England, assignors to Westrex Company Limited, London, England

Filed June 21, 1974, Ser. No. 481,722

Claims priority, application United Kingdom, June 25, 1973, 30016/73

Int. Cl.² G03B *1/24*

U.S. Cl. 352—187 **7 Claims**



1. A mechanical drive arrangement particularly for cinematograph projectors, comprising:

a. drive means drivingly engaging a double-sided toothed drive belt;

b. a first sprocket and a second sprocket adapted to be engaged by said drive belt;

c. shutter drive sprocket drivingly engaged by said drive belt;

d. intermittent motion drive sprocket drivingly engaged by said drive belt, said intermittent motion drive sprocket being rotatably mounted on disc means rotatable about a center of said disc means, which center coincides with a circumference of said intermittent motion drive sprocket; and

e. intermittent motion film sprocket rotatably mounted on said disc means, and being adapted to be drivingly engaged by said intermittent motion drive sprocket, whereby upon rotation of said disc means, said drive belt engages said intermittent motion drive sprocket substantially on a tangent point of a circumference of said intermittent motion drive sprocket.

3,947,102

APPARATUS FOR RETRIEVING MICROIMAGES

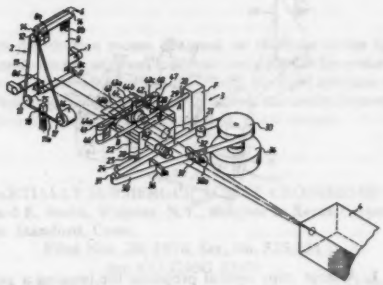
Wilfried Hofmann, Taufkirchen; Horst Bickl, Munich, and Walter Gutmann, Lochhofen, all of Germany, assignors to AGFA-Gevaert, Leverkusen, Germany

Filed Oct. 15, 1974, Ser. No. 515,006

Claims priority, application Germany, Oct. 13, 1973, 2351580

Int. Cl.³ G03B *23/08*

U.S. Cl. 353—27 A **13 Claims**



1. In an apparatus for projecting the images of selected microfilm frames on sheet-like microforms wherein the frames form a plurality of rows, a combination comprising means for transporting a microform in a direction at right angles to the rows of frames on said microform which is introduced into said transporting means whereby the latter can place a selected row of frames into a predetermined projection position, said transporting means comprising driven microform engaging elements, a belt movable to drive said elements and having encoded information thereon for identifying rows of frames on a microform, a motor for moving said belt, and detector means operatively connected with said motor and positioned to scan said information on said belt so as to effect the stoppage of said belt and of the microform in said transporting means when a selected row of frames reaches said projection position; and a projection system having lens means in line with said projection position, and means for moving said lens means in parallelism with the rows of frames on a microform in said transporting means, said lens means being movable into register with a selected frame in the row of frames occupying said projection position, said moving means comprising a band having a portion operatively connected with said lens means, a second motor for moving said band, and means for arresting said second motor when said lens means registers with a selected frame of the row occupying said projection position, said arresting means comprising information encoded on said band and identifying selected frames of a row of frames on a microform in said transporting means and additional detector means adjacent the path of movement of said band and operatively connected with said second motor to arrest the latter in response to detection of information identifying a selected frame of the row of frames occupying said projection position.

3,947,103

LOW PROFILE EPISCOPIC PROJECTOR AND OPAQUE MATERIALS THEREFOR

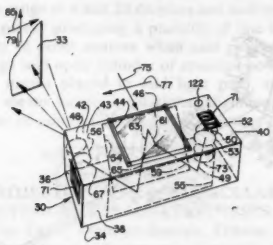
Gerald Altman, 41 Westminster Road, Newton, Mass. 02159

Continuation-in-part of Ser. Nos. 329,574, Feb. 5, 1973, Pat. No. 3,837,739, and Ser. No. 419,063, Nov. 26, 1973, which is a continuation-in-part of Ser. No. 81,987, Oct. 19, 1970, Pat. No. 3,778,142. This application Aug. 26, 1974, Ser. No. 500,322

The portion of the term of this patent subsequent to Oct. 28, 1992, has been disclaimed.

Int. Cl.[2] G03B *21/06*

U.S. Cl. 353—66 24 Claims



1. A large copy optical projector for imaging a generally horizontal copy sheet on a generally vertical screen spaced from said projector, said copy sheet having an upper face and a lower face and being in association with a specular reflector, said optical projector comprising:

a. housing means defining an enclosed chamber, said housing means having a forward portion, a rearward portion and a substantially horizontal upper portion, said upper portion having a first opening throughout a major portion of its area, said opening defining the field of said copy sheet;

b. flat Fresnel lens means at said opening in said upper portion, said Fresnel lens means being substantially coextensive with said opening in said upper portion;

c. said copy sheet, when in superposed relation with said Fresnel lens means, being substantially coextensive therewith and having substantially the entire upper face of said copy sheet accessible visually and manually to an operator;

d. said housing means having a second opening, objective lens means at said second opening for receiving imaging light along an imaging path and defining an optical axis;

e. lamp means in said chamber for directing illuminating light along an illuminating path;

f. first plane mirror means underlying said Fresnel lens means within said chamber, said first plane mirror means slanting downwardly from said rear portion toward said front portion;

g. second plane mirror means at said front portion;

h. said illuminating light diverging in said illuminating path along a first illuminating axis segment communicating with said first plane mirror means and then being reflected along a second illuminating axis segment communicating with said Fresnel lens means;

i. said imaging light reflected from said copy sheet being converged by said Fresnel lens in said imaging path along a first imaging axis segment communicating with said first plane mirror means, next being reflected along a second imaging axis to said second plane mirror, and then being reflected along a third axis segment to said objective lens means;

j. said lamp means and said objective lens means being at opposite edges of said first plane mirror means.

3,947,104

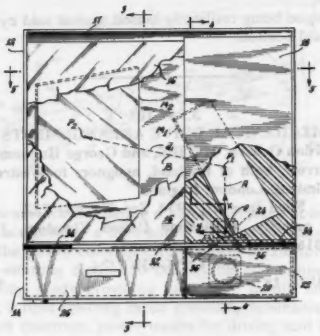
COMPACT IMAGING APPARATUS AND PROJECTION DISPLAY DEVICE

Adnan Waly, Stamford, Conn., and George J. Yevick, Leonia, N.J., assignors to Personal Communications, Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 176,805, Sept. 1, 1971, abandoned. This application Dec. 13, 1972, Ser. No. 314,710

Int. Cl.[2] G03B *21/28, 23/08*

U.S. Cl. 353—78 4 Claims



1. A compact imaging apparatus for projecting and rotating an image, comprising:

A. a housing in which is defined

1. an x, y, z orthogonal coordinate system having an origin;

2. an image plane parallel to the plane defined by the x and y axes and displaced therefrom by a distance d', and

3. an image area in the image plane spaced from the origin of said coordinate system by a predetermined distance measured on said y axis,

B. an imaging device for projecting an image, said imaging device being mounted in said housing and having an optical axis which originates at the origin of said coordinate system and is parallel to said x axis, and

C. means for reflecting the image projected from said imaging device along a reflected optical axis which is an extension of said imaging device optical axis and for rotating the image a predetermined degree to be focused on said image plane in said image area with a desired orientation, said means comprising

1. a first planar mirror having a normal vector $\overline{n_1}$ the direction cosine of which is specified by the equation

$$\overline{n_1} = \frac{(x_2 - x_1 - d', y_2, z_2)}{\sqrt{2d_1}\ \sqrt{d_1 + (x_1 - x_2)}}$$

and

2. a second planar mirror having a normal vector $\overline{n_2}$, the direction cosine of which is specified by the equation

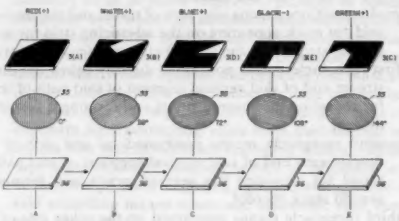
$$\overline{n_2} = \frac{(x_2 - x_1, y_2, z_2 - d_1)}{\sqrt{2d_1}\ \sqrt{d_1 - z_2}}$$

where d_1 is the distance between the point (x_1, y_1, z_1) of intersection of said optical axis with said first mirror and the point (x_2, y_2, z_2) of intersection of said reflected optical axis with said second mirror, the point of intersection of said reflected optical axis with said image plane being (x_3, y_3, z_3).

3,947,105
PRODUCTION OF COLORED DESIGNS

Albert Ernest Smith, Riverside, Calif., assignor to Technical Operations, Incorporated, Boston, Mass.

Filed Sept. 21, 1973, Ser. No. 399,367
Int. Cl.[2] G03B *21/00, 21/14*
U.S. Cl. 353—121 8 Claims



1. In the art of producing visually-pleasing design patterns of differently colored components which occupy mutually-exclusive areas and which may include either or both of black and white as respective "color components," the method of producing a replica of an original pattern of components occupying mutually-exclusive areas, which replica is suitable for use in an imaging system for producing an image of said original pattern and for arbitrarily coloring each component over a selectible range of continuously variable intensity independent of the others in said image, which method comprises providing a master of said original pattern in which each component is photometrically separable substantially in its entirety from each of the other components, photometrically separating each component from the others to form a record of said component, modulating said record uniformly throughout its confines substantially exclusively with a spatial-frequency carrier having a unique azimuthal orientation and a spatial frequency capable of resolving the individual components, and combining all of the so-modulated records to form a single replica of the original pattern in which single replica each component is located in its original relation to the other components and bears its spatial carrier to the exclusion of the spatial carriers of all the other components, for visual examination of the collective effect of the components of said image of said original pattern when produced with the aid of said replica.

3,947,106
ILLUMINATION MEANS FOR USE IN PHOTOCOPYING MACHINE

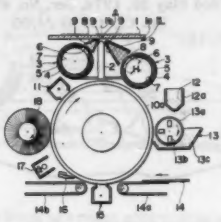
Hiroshi Hamaguchi, and Atsuyuki Tanaka, both of Sakai, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 10, 1974, Ser. No. 513,923
Claims priority, application Japan, Oct. 22, 1973, 48-122879
Int. Cl.[2] G02B *5/14*; G03B *27/54*
U.S. Cl. 355—1 4 Claims

1. An improved illumination means for use in a photocopy machine which uses in its optical system an image transmitter comprised of a plurality of image transmitting fibers bundled together to transfer the illuminated object image being copied to the copying means within the copying machine, said improvement comprising:

at least one tubular light-generation means positioned adjacent said image transmitter for generating the light necessary to illuminate the object image being transmitted through the image transmitter and having a light emission slit parallel to the longitudinal axis thereof directed toward the object to be illuminated;

at least one light-guide means of light conductive material having a trapezoidal longitudinal cross-section, the wide base of the trapezoidal shape positioned adjacent the emission slit of the light generation means and the narrow base of the trapezoidal shape directed toward the object to be illuminated; and

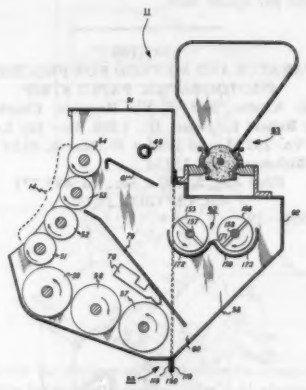


light distribution means centered on the base of the light guide means adjacent said light emission slit for ensuring even distribution of the light from the light emission slit entering the light guide means across the entire cross-section area of the base of said light guide means.

3,947,107
PARTIALLY SUBMERGED ACTIVE CROSSMIXER

Richard E. Smith, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 20, 1974, Ser. No. 525,531
Int. Cl.[2] G03G *15/09*
U.S. Cl. 355—3 DD 15 Claims



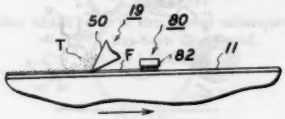
1. In a development system for developing latent electrostatic images carried by a substrate through the use of a developer containing triboelectrically charged toner and carrier particles; said system including a sump for storing a first supply of developer, and means for circulating developer along a predetermined path running from said sump, across said substrate and then back to said sump; the improvement comprising an active crossmixer positioned in said path above said sump for mixing and blending developer returning to said sump; said crossmixer including a baffle positioned in said path remote from said sump to provide a second continuously changing, locally confined supply of developer in addition to said first supply, and a rotatably driven auger mounted above said baffle and partially submerged in said second supply said auger being partially cupped by said baffle for laterally translating said locally confined supply of developer.

3,947,108

CLEANING SYSTEM

Raghulinga R. Thettu, Webster, and Donald J. Quant, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 20, 1974, Ser. No. 471,524
Int. Cl.² G03G *21/00*
U.S. Cl. 355—15 **11 Claims**



1. In a reproducing apparatus including a moving photoconductive imaging surface, means for forming an electrostatic image on said surface, means for developing said image with toner particles to render it visible, means for transferring said developed image to a sheet of final support material, and blade cleaning means for cleaning said photoconductive imaging surface to remove substantially all of the residual toner particles therefrom, the improvement wherein, said apparatus further includes;

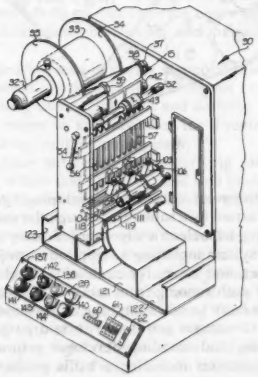
means following said blade cleaning means for substantially continuously engaging said imaging surface while it is moving for removing from said imaging surface film-like contaminants which can cause deletions in said image, said contaminant removing means comprising a scrubbing pad of fibers which scrub said surface to dislocate and remove said films, said pad being biased against said surface with a normal force of from about 1 to about 4 pounds per square inch.

3,947,109

APPARATUS AND METHOD FOR PROCESSING PHOTOGRAPHIC PAPER STRIP

Claude E. Kinder, 5634-F Via Romano, Charlotte, N.C. 28202; Robert L. Jones, Jr., 1308 Blue Jay Lane, Richmond, Va. 23223, and Walter W. Marsh, 4114 Goldfinch Drive, Richmond, Va. 23234

Filed Aug. 8, 1974, Ser. No. 495,771
Int. Cl.² G03B *29/00*
U.S. Cl. 355—29 **11 Claims**



1. An apparatus for processing an elongated paper strip composed of a series of closely spaced photographic prints or the like and wherein the strip includes a cut mark positioned at a predetermined location with respect to the space between adjacent prints, a reprint mark positioned at a predetermined location with respect to those prints which have been selected to be reprinted, and a reject mark positioned at a predetermined location with respect to those prints which have been determined to be totally unsatisfactory, said apparatus comprising

means for advancing the strip along a path of travel, said path of travel including a substantially vertical segment at the downstream end thereof,

means positioned along said path of travel and responsive to said cut mark appearing on the advancing strip for severing the strip along the space between adjacent prints,

first receptacle means positioned directly below the downstream end of said vertical segment of said path of travel for receiving the severed prints and forming a first stack thereof,

second receptacle means positioned on one side of the downstream end of said vertical segment of said path of travel for receiving the severed prints and forming a second stack thereof,

third receptacle means positioned on the other side of the downstream end of said vertical segment of said path of travel for receiving the severed prints and forming a third stack thereof,

means positioned adjacent the downstream end of said vertical segment and responsive to said reprint mark appearing on the advancing strip for deflecting the associated severed print into said second receptacle means, said deflecting means comprising an air nozzle positioned adjacent the downstream end of said vertical segment of said path of travel and adapted to direct air laterally across said path of travel toward said second receptacle means, means for sensing the presence of a reprint mark on the advancing strip, and means responsive to a signal from said reprint sensing means for injecting air through said nozzle and against the leading end of the associated print, and

means positioned adjacent the downstream end of said vertical segment and responsive to said reject mark appearing on the advancing strip for deflecting the associated severed print into said third receptacle means,

whereby the satisfactory prints fall directly into said first receptacle to form a first stack, while the prints which require reprinting fall into said second receptacle to form a second stack, and while the prints which are totally unsatisfactory fall into said third receptacle to form a third stack.

3,947,110

AUTOMATIC PHOTOGRAPH PRINTING CONTROL SYSTEM

Yoshihiro Yamada, No. 1685-223, Mukaiyama, Oaza Hirabari, Tenpakucho, Showa, Nagoya, Aichi, Japan

Continuation of Ser. No. 340,163, March 12, 1973, abandoned. This application July 12, 1974, Ser. No. 488,121
Claims priority, application Japan, Mar. 29, 1972, 47-30664
Int. Cl.² G03B *27/78*
U.S. Cl. 355—38 **3 Claims**

1. An OFF-LINE automatic photograph printing control system consisting of a reader and a printer wherein said reader comprises:

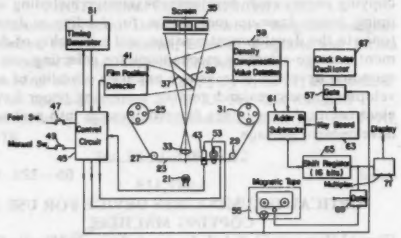
a frame stop position detecting as well as recording means including a negative film frame position detection mechanism for determining the stop position of respective negative films to be used upon printing, a negative film automatic feed and stop mechanism and a negative film mark forming mechanism for determining the stop position of effective frames upon recording and to be used upon printing;

frame visual inspection means including a display mechanism and a negative film manual feed mechanism;

manual input means of exposure light correcting value relating to color failure and abnormal light negatives;

an information recording means consisting of a write-in mechanism, a recording mechanism and a recording medium; and,

a reader control means for successively operating said respective units and means, which is constituted by logic circuitry so as to place respective portions in operating condition only when said automatic feed mechanism is set to operating state, operate said automatic stop mechanism every time said frame position detection mechanism detects each frame, operate said negative film mark forming mechanism when said automatic stop mechanism is actuated and the negative film is stopped, record color exposure light correcting value from said manual input means into said information recording means, and interrupt automatic feed function as well as automatic write-in function of color exposure light correcting value into said recording means when said automatic feed mechanism is released;



while said printer comprises:

automatic printer constituents including a negative film setting mechanism, a printing paper feed mechanism, an optical system for printing, a density measuring unit and an exposure light control mechanism;

a detection and stop means for designated effective frames, including a mark detection mechanism and a negative film feed and stop mechanism;

an exposure light intrinsic value correction means including a readout mechanism from said recording medium and an arithmetic unit of compensating the exposure light intrinsic value with exposure light correcting value; and

a printer control means for successively operating said respective constituents and means, which is constituted by logic circuitry so as to operate said negative film stop mechanism when said mark detection mechanism is actuated, and operate said readout mechanism and said arithmetic unit when said negative film stop mechanism is actuated.

3,947,111

DOCUMENT FEEDING APPARATUS

Werner F. Hoppner, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 26, 1974, Ser. No. 464,728

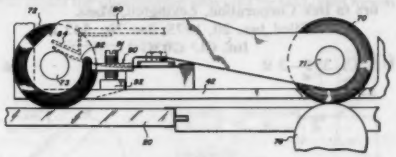
Int. Cl.[2] G03B *27/62*

U.S. Cl. 355—50 **18 Claims**

1. An apparatus for feeding individual sheets comprising:

means for feeding said sheets, said feeding means comprising at least one roll; and

means for biasing said roll against said sheet, said biasing means comprising a first means for biasing said roll against said sheet with a force normal to said sheet within a first range of normal force, for a sheet having a thickness in a range up to a first thickness and second means for providing an additional normal force component within a range of normal force components for stepwise increasing said force normal to said sheet to an amount greater than said first range of normal force for sheets



having a thickness in a range greater than said first thickness.

3,947,112

DEVICE FOR DOCUMENT FILMING

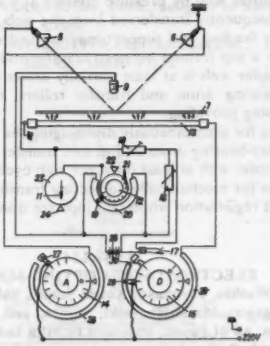
Erich Hahn, and Frank Reissig, both of Dresden, Germany, assignors to VEB Pentacon Dresden, Dresden, Germany

Filed June 24, 1974, Ser. No. 482,095

Claims priority, application Germany, Aug. 8, 1973, 172757

Int. Cl.[2] G03B *27/74, 27/76*

U.S. Cl. 355—68 **9 Claims**



1. A device for photographing documents comprising:

i. a surface for supporting a document to be photographed;

ii. a camera positioned above said surface, to receive light reflected from and transmitted by a document when supported on said surface;

iii. first illumination means for illuminating from above a document when supported on said surface;

iv. second illuminating means for illuminating from below a document when supported on said surface, having spectral radiation characteristics different from said first illuminating means;

v. means for selecting between illumination from above and from below;

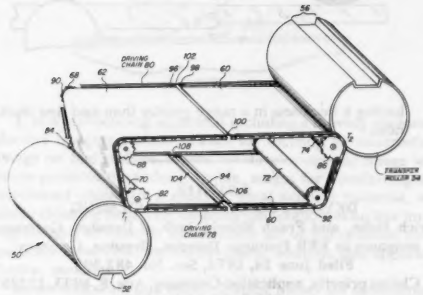
vi. an exposure measuring device for receiving light reflected from or transmitted through a document when supported on said surface, and for indicating when correct exposure conditions have been set;

vii. correction means for correcting the reading of the exposure meter to take account of said different spectral radiation characteristics of the first and second illuminating means.

3,947,113
ELECTROPHOTOGRAPHIC TONER TRANSFER APPARATUS

William Raymond Buchan, Lincoln; James A. Kulpan, Roslindale, and Edward Francis Mayer, Acton, all of Mass., assignors to Itek Corporation, Lexington, Mass.

Filed Jan. 20, 1975, Ser. No. 542,155
Int. Cl.² G03G *15/16*
U.S. Cl. 355—3 R **16 Claims**



1. In an electrophotographic transfer apparatus wherein toner is transferred from the surface of a toner-bearing drum to a transfer web by pressure contact at a nip therebetween and subsequently transferred from the web to a support medium by feeding said support medium and said transfer web through a nip formed between transfer rollers, and wherein the transfer web is at least partially driven by means of the toner-bearing drum and transfer rollers, the improvement comprising providing:

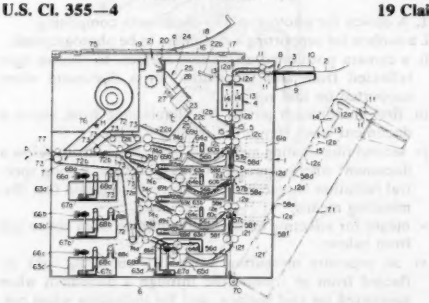
means for simultaneously disengaging the nips at both said toner-bearing drum and at said transfer rollers from said transfer web at least once per web cycle; and,

means for mechanically correcting transfer web alignment and registration while said nips are disengaged.

3,947,114
ELECTROSTATIC COPYING MACHINE

Takaji Washio, Toyonaka; Koichi Sasaki, Sakai; Kazumi Iida, Neyagawa; Masahide Iseki, Kyoto, and Tatsuo Aizawa, Osaka, all of Japan, assignors to Mita Industrial Company Limited, Osaka, Japan

Filed July 12, 1974, Ser. No. 488,062
Claims priority, application Japan, July 17, 1973, 48-81061
Int. Cl.² G03G *15/01*
U.S. Cl. 355—4 **19 Claims**

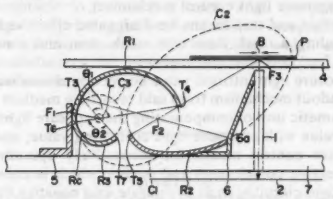


1. A versatile electrostatic copying machine comprising an illuminating zone for illuminating an original to be copied in the stationary or moving state by a light source, a light exposing zone for light-exposing imagewise a statically charged photosensitive layer, an optical system for optically connecting said illuminating zone with said light exposing zone and projecting an image of the original on the photosensitive layer and a development mechanism for developing an electrostatic latent image formed on the photosensitive layer directly or after it has been transferred onto a transfer paper, wherein said optical system comprises a light-selecting mechanism for selecting an optional light from white light and color-separated lights and exposing the photosensitive layer to said selected light and an exposure light quantity-adjusting mechanism for adjusting the exposure light quantity to an optimum quantity with respect to each of a plurality of said light, the development mechanism comprises a development operation-selecting mechanism for selecting an optional development operation among a plurality of development operations differing in the toner hue, said light-selecting mechanism and development operation-selecting mechanism are actuated independently or in the state interlocked with each other so that a copy having a desired coloring effect can be obtained, and said development mechanism comprises a plurality of independent development passages differing in the hue of a toner to be applied to an electrostatic latent image formed on a copying paper, each development passage including a developing toner draw-up mechanism for feeding a developing toner to the development passage, and a plurality of development passage-selecting mechanisms for selecting one corresponding development passage among a plurality of said development passages and guiding a copying paper having an electrostatic latent image formed thereon into said selected development passage.

3,947,115
OPTICAL ILLUMINATION DEVICE FOR USE IN COPYING MACHINE

Hiroshi Hamaguchi, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed July 22, 1974, Ser. No. 490,710
Claims priority, application Japan, Aug. 9, 1973, 48-93905[U]
Int. Cl.² G03B *15/28*, *15/32*
U.S. Cl. 355—8 **8 Claims**



8. In a copying apparatus of the type including a light sensitive surface means for receiving a projected image of an object to be copied; electrostatic charging means for charging a portion of said light sensitive surface means; and optical illumination means for exposing and projecting an image of an object onto a charged portion of said light sensitive surface means; the improvement wherein:

said optical illumination means comprises first and second reflectors respectively having first and second concave, reflective surfaces which comprise portions of first and second concave walls defining hollow right elliptical cylinders, each having first and second line foci,

said first and second reflective surfaces being oppositely disposed with one of the line foci of the elliptical cylinder of said first reflective surface coinciding with one of the line foci of the elliptical cylinder of said second reflective surface, the other foci of said cylinders of said first and second reflective surfaces being positioned on opposite sides of the commonly shared foci,

said first and second reflective surfaces each having an edge extending parallel to said commonly shared line foci at a

position in an imaginary plane connecting said commonly shared foci and the other line focus of said cylinder of said second reflective surface,

means to position an object at said other line focus of said cylinder of said second reflective surface, and

an elongated source of light disposed along the other focus of said cylinder of said first reflective surface to illuminate said object,

and further comprising:

a support mounted for movement along said light sensitive surface means, said optical illumination means and said electrostatic charging means being positioned on said support; and

means for moving said support, and thus said electrostatic charging means and said optical illumination means, along said light sensitive surface means, thereby first charging a portion of said light sensitive surface means and thereafter exposing the thus charged portion with an image of an object.

3,947,116

PHOTOCOMPOSING MACHINES

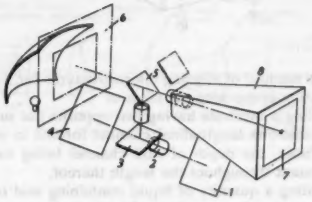
Daniel Camille Cornelius Dewaele, Beselare, Belgium, assignor to Lamson Paragon Limited, London, England and Firma Dirk Strobbe PVBA, Izegem, Belgium

Continuation of Ser. No. 161,245, July 9, 1971, abandoned. This application Dec. 27, 1973, Ser. No. 428,630

Claims priority, application United Kingdom, July 10, 1970, 33692/70

Int. Cl.² G03B *27/52*

U.S. Cl. 355—40 **4 Claims**



1. A photocomposing machine comprising: means to project an image corresponding to a portion of a copy form onto a sensitized material whereby image parts of the copy form are built up in steps onto the sensitized material, means for controlling the position of the image corresponding to said portion of the copy form onto said sensitized material including carrier means for supporting a representation of the images, drive means for moving said carrier means, pulse generating means to drive said drive means in two orthogonal directions, control means for generating signals to control said drive means and including counting means to count the number of pulses supplied to said drive means and means to stop said drive means at a selected position of a plurality of predetermined positions represented by said number of pulses when said counting means has counted to a predetermined number representing a respective position of said plurality of predetermined positions.

3,947,117

EXPOSURE CONTROL SYSTEM

Samir Basu, and Gerald J. Maguire, both of Stevenage, England, assignors to Xerox Corporation, Stamford, Conn.

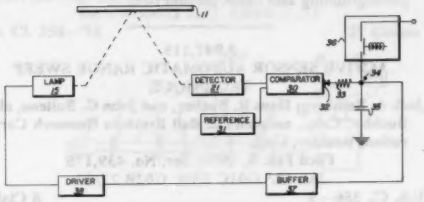
Filed June 17, 1974, Ser. No. 479,945

Claims priority, application United Kingdom, Dec. 21, 1973, 59539/73

Int. Cl.² G03B *27/74*, *27/78*; H05B *37/02*; G01J *1/32*

U.S. Cl. 355—68 **2 Claims**

1. An automatic exposure system for a copying machine which includes a scanning optical system having a prescan period, comprising lamp means and a lamp illumination control loop operatively connected to a light intensity detector positioned to receive light reflected from an original document to be copied, and a lamp illumination control circuit including a lamp drive circuit, said control loop being arranged to adjust the illumination provided by said lamp means



in response to signal generated by said detector during prescan period to maintain the intensity of light being received by an image forming surface from the original document at a predetermined level, said lamp means comprising a preheated fluorescent lamp and said electrical supply comprises supply for the lighting element of the lamp.

3,947,118

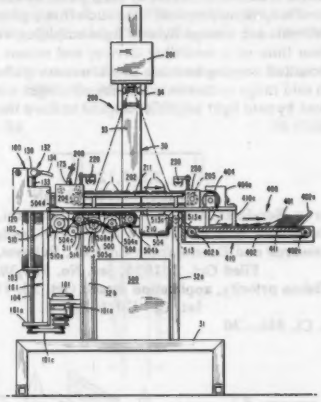
METHOD OF PHOTOGRAPHING A PLURALITY OF CARDS

Andrew L. Amort, Ann Arbor, Mich., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 22, 1974, Ser. No. 526,250

Int. Cl.² G03B *27/32*

U.S. Cl. 355—77 **2 Claims**



1. A method of photographing a plurality of individual cards simultaneously including the steps of:

removing a first individual card from a stack of cards;

feeding said first card through a roller;

advancing said first individual card from said roller to a belt;

removing a second card from said stack;

feeding said second card to said roller;

delaying the advance of said second card from said roller to said belt by a predetermined time interval so as to create a space between said first and said second cards on said belt;

removing, feeding and advancing a predetermined number of successive cards in the manner described;

sensing the number of cards removed, fed and advanced;

stopping the removal, feeding and advancement of said cards in response to a predetermined number of cards having been advanced to said belt;

sensing the height of cards in said stack;

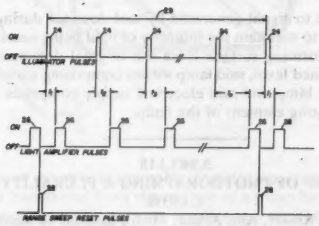
raising said stack to a height sufficient so that the cards may be moved in response to said stack being diminished below a predetermined level; and

photographing said cards on said belt.

3,947,119
ACTIVE SENSOR AUTOMATIC RANGE SWEEP TECHNIQUE

Jack A. Bamberg; Hans R. Bucher, and John G. Bultena, all of Boulder, Colo., assignors to Ball Brothers Research Corporation, Boulder, Colo.

Filed Feb. 4, 1974, Ser. No. 439,175
Int. Cl.² G01C *3/08*; G02B *27/00*
U.S. Cl. 356—5 **8 Claims**

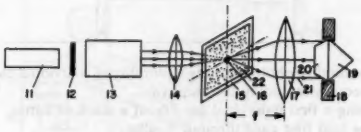


4. An electro-optical device comprising: a pulsing source of illumination; a gated optical receiving means providing an image as an output; control means for systematically causing said receiving means to be gated "on" for a discrete time period T after the emission of each pulse by said source, said control means varying said time such that a plurality of range increments are viewed by said light amplifier within the integration time of a recording device; and means for causing a preselected varying number of illuminator pulses to impinge each said range increment whereby all ranges within the scene viewed by said light amplifier appear to have the same brightness.

3,947,120
GEM IDENTIFICATION

Charles Bar-Issac, Ramat Gan; Ephraim Frei, and Shmuel Shtrikman, both of Rehovot, all of Israel, assignors to Yeda Research and Development Co. Ltd., Rehovot, Israel

Filed Oct. 2, 1974, Ser. No. 511,383
Claims priority, application Israel, Oct. 23, 1973, 43465
Int. Cl.² G01N *21/00*
U.S. Cl. 356—30 **21 Claims**



1. A device for obtaining a reproducible identification pattern of a polished gemstone, comprising, in combination:

light directing means for creating a parallel light beam and directing the light beam onto the gemstone, said light directing means including light source means for providing a parallel light beam, a first focusing lens in the path of the light beam for focusing the light beam onto a focal point, and a second lens located downstream of said focal point in the path of the light beam at an optical path distance from said focal point equal to the focal length of said second lens;

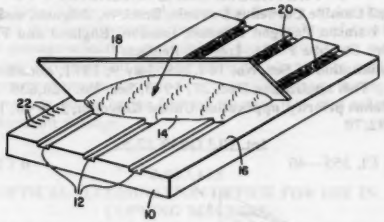
holding means disposed downstream of said second lens for holding the gemstone in the path of the light beam with a plane reference surface thereof at a defined reproducible angle to the parallel light beam directed thereon through said second lens; and

a screen optically located on the opposite side of said second lens as the gemstone at an optical path distance from said second lens equal to the focal length thereof, whereby said screen receives reflections from the gemstone passing through said second lens.

3,947,121
METHOD FOR ALIGNING MICROSTRUCTURES

Douglas A. Cotter, and Charles H. Rogers, both of Raleigh, N.C., assignors to Corning Glass Works, Corning, N.Y.

Filed July 30, 1973, Ser. No. 383,832
Int. Cl.² G02B *21/34*
U.S. Cl. 356—38 **2 Claims**



1. The method of aligning microstructures for microscopic examination comprising the steps of

providing a substrate having two opposite flat surfaces and at least one longitudinal channel formed in one of said surfaces, the depth of said channel being substantially constant throughout the length thereof,

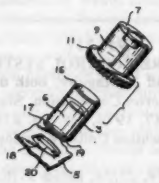
depositing a quantity of liquid containing said microstructures on said one surface of said substrate,

pushing the microstructure containing liquid across said one surface of said substrate to permit the microstructures to drop into and be deposited in said channel in an aligned juxtaposed relationship, said channel being of sufficient size to accommodate a single layer of said microstructures in substantially single file in said aligned juxtaposed relationship, and removing the balance of said liquid.

3,947,122
CUVETTE AND STIRRER FOR OXIMETER

Terence Walker, East Aurora, N.Y., assignor to American Optical Corporation, Southbridge, Mass.

Filed Dec. 16, 1974, Ser. No. 533,401
Int. Cl.² G01N *33/16*, *1/10*
U.S. Cl. 356—41 **8 Claims**



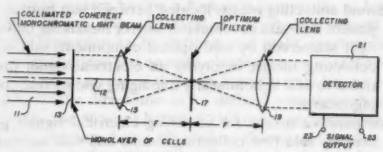
1. A cuvette and stirrer assembly for use with liquid reflectance measuring apparatus having a drive gear which com-

prises a cuvette including a circular cross-sectioned, cylindrical body having a cylindrical coaxial recess in the top thereof to hold a liquid sample, the bottom of said body being transparent and having a planar exterior surface adapted to transmit light from said apparatus into said recess, and a stirrer including a hollow cover having a cylindrical cavity in one end thereof and complimentary to the exterior of said body, said cavity being adapted to receive said body and to align said cavity and said recess coaxially, the other end of said cover being a top, said top having an elongated member extending therefrom into said recess, a portion of said elongated member being located within said recess and being spaced from the axis thereof, an external gear concentrically mounted on said cover to engage the drive gear whereby said cover may be rotated relative to said body and said sample stirred by the member during measuring.

3,947,123
COHERENT OPTICAL ANALYZER

F. Paul Carlson, Seattle, Wash., and Joseph E. Ward, III, St. Paul, Minn., assignors to The Board of Regents of the University of Washington, Seattle, Wash.

Filed May 13, 1974, Ser. No. 469,376
Int. Cl.² G01N *33/16*
U.S. Cl. 356—39 **15 Claims**



7. Apparatus for identifying a particle or particles of a given type located in a sample containing particles of various types, said apparatus comprising:

a beam of coherent wave energy;

support means for supporting a monolayer of said sample containing particles of various types in said beam of coherent wave energy in a position such that said particles scatter said beam;

a first collecting means for collecting the wave energy scattered by said monolayer; and,

a minimum mean-square error linear filter mounted so as to filter the scattered wave energy collected by said first collecting means, said minimum mean-square error linear filter passing the wave energy scattered by said particle or particles of a given type and suppressing the wave energy scattered by particles other than said particle or particles of said given type, said minimum mean-square error linear filter having a spatial frequency response having the following transfer function:

$$H(\omega) = \frac{S_{ss}(\omega)}{S_{ss}(\omega) + S_{nn}(\omega)}$$

where:

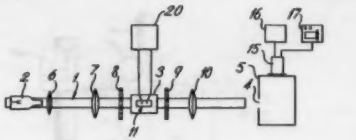
$S_{ss}(\omega)$ is the power spectral density of the particles of said given type; and,

$S_{nn}(\omega)$ is the power spectral density of particles other than particles of said given type.

3,947,124
ANALYTICAL SPECTROELECTROCHEMISTRY

Thomas Summers West, Croydon, England, assignor to National Research Development Corporation, London, England

Filed Oct. 18, 1974, Ser. No. 516,016
Claims priority, application United Kingdom, Oct. 26, 1973, 50038/73; Aug. 12, 1974, 35449/74
Int. Cl.² G01J *3/42*; G01N *21/52*
U.S. Cl. 356—74 **27 Claims**



1. A method of analysing material by spectrometry, comprising the steps of:

providing in electrical contact with a pair of charged electrodes an electrolytic medium containing said material in solution to produce a lightabsorbing species in solution by electrolysis at a surface of one of said electrodes,

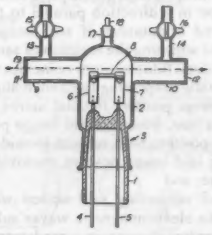
directing through said medium over said surface in a rectilinear path a beam of light having a wavelength for causing said beam to interact with said lightabsorbing species along said path; and

detecting the intensity of light emerging from said path.

3,947,125
ATOMIC ABSORPTION AND FLUORESCENCE SPECTROSCOPY

Thomas Summers West, Croydon, England, assignor to National Research Development Corporation, London, England

Division of Ser. No. 2,532, Jan. 13, 1970, Pat. No. 3,858,980.
This application Oct. 10, 1974, Ser. No. 513,567
Claims priority, application United Kingdom, Jan. 16, 1969, 2590/69
The portion of the term of this patent subsequent to Jan. 7, 1992, has been disclaimed.
Int. Cl.² G01J *3/30*
U.S. Cl. 356—85 **10 Claims**



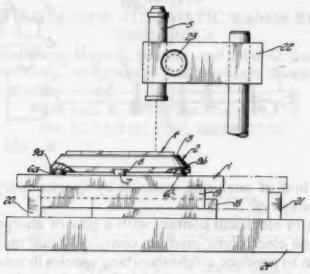
1. A method of spectroscopy comprising the operations of producing from a sample under investigation a cloud of free atoms in the vapour phase, directing into the cloud radiation of an appropriate wavelength to interact with the atoms, and measuring the intensity of radiation emerging from the cloud, wherein the improvement comprises producing the cloud of free atoms by heating a body of graphite on which the sample has been deposited without moving the graphite body between deposition of the sample and heating of the body, so as to evaporate the sample, the body being disposed wholly below the region in which interaction occurs between the atoms and the radiation directed into the cloud and the body being heated by the passage through it of an electric current while it is surrounded by an inert atmosphere.

3,947,126

METHOD FOR IMAGE ALIGNMENT

William M. Mendez, Princeton, N.J., assignor to Oxy Metal Industries Corporation, Detroit, Mich.

Filed Oct. 9, 1973, Ser. No. 404,825
Int. Cl.² G01B 9/04
U.S. Cl. 356—150 **3 Claims**



1. In a method for forming an image negative on a printing screen, the improvement which comprises locating said image on a photo-sensitized screen in a predetermined orientation by the steps of:

a. affixing said screen to a support frame;

b. providing indicia of translational and rotational orientation on an image positive by the application of fiducial marks identifying a point and the slope of a line passing through said point on said image positive;

c. placing said image positive on said screen;

d. providing reference indicia having predetermined positions with respect to the orientation of said frame, corresponding to the desired position of said image positive indicia;

e. aligning said image positive indicia with said reference indicia by placing said frame in a first predetermined three dimensional orientation and adjusting the location of said image positive so that the point fiducial mark coincides with the cross hair of an immovable microscope and then moving said frame to a second predetermined orientation in a direction parallel to the line defined by the desired orientation of said image positive fiducial marks and adjusting the location of said image positive so that said slope fiducial mark coincides with said cross hair and thereafter repeating the above alignments until each of said image positive fiducial marks is coincident with said cross hair, whereby said image positive is placed in a unique position with respect to said frame;

f. rendering said image positive immovable with respect to said frame; and

g. thereafter subjecting said screen with image positive thereon to electromagnetic waves sufficient to form an image negative thereon in a predetermined orientation.

3,947,127

OPTICAL COMPONENT FUNCTIONAL TESTER

Harold E. Bennett; Marion J. Soileau, both of China Lake, Calif., and Guilford J. Hutcheson, Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 11, 1974, Ser. No. 522,388
Int. Cl.² G01B 9/00, 11/30
U.S. Cl. 356—124 **6 Claims**

1. An optical testing apparatus for testing the quality of optical components comprising:

support means for mounting said optical component to allow rotation for incremental scanning of its total surface area;

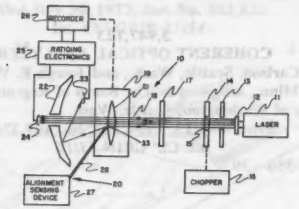
coherent light source for illuminating said optical component on said support means with parallel light rays;

a chopper means located between said optical component and said light source for breaking the light rays in a series of pulses of a predetermined frequency;

adjustable aperture means positioned between said coherent light source and said chopper means for limiting the number of light rays that illuminate said optical component;

accumulator mirror means located adjacent and behind said optical component having a centrally located perforation for allowing passage of parallel light rays;

first collecting means located adjacent and behind said accumulator mirror means relative to said optical component, for collecting all parallel light rays and supplying an electrical signal proportional to the light intensity impinging said first collecting means;



second collecting means located between said optical component and said accumulator mirror means for collecting light scatteredd by said optical component; said second collecting means supplying an electrical signal proportional to said light intensity impinging said second collecting means;

comparative means for receiving electrical signals generated by said first collecting means and said second collecting means for supplying an electrical signal output that is proportional to the ratio of the two signals; and

recorder means electrically coupled to receive the electrical output from said comparative means for visually displaying the magnitude of the scattering light level;

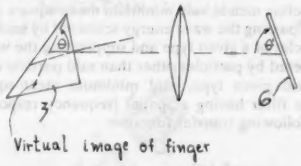
whereby movement of the support means allows the light to be scanned over discrete portions of the optical component for determination of surface imperfections.

3,947,128

PATTERN COMPARISON

Zvi Weinberger, 24 Yehoshua Bin Nun, and Avram Kalisky, 26 Hahagana St., both of Jerusalem, Israel

Filed Apr. 19, 1974, Ser. No. 462,303
Int. Cl.² G06K 9/00
U.S. Cl. 356—71 **16 Claims**



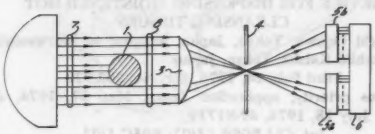
14. A method for comparing the image of a given member with an optical modification in a permanent record of said member, the optically modified permanent record including a predetermined, significantly distorted, geometrically dissimilar image of said member, comprising the steps of projecting a similar optical modification of an image of said member onto the optically modified permanent record of said member,

oscillating said projected image with respect to said permanent record, projecting the resulting image onto a photoelectric element and detecting a predetermined fluctuation in the electric current from said photoelectric element.

3,947,129
APPARATUS FOR CONTACTLESS MEASURING OF THE DIMENSIONS OF OBJECTS

Klas Rudolf Wiklund, Taby, Sweden, assignor to AGA Aktiebolag, Lidingo, Sweden

Filed Oct. 3, 1974, Ser. No. 511,610
Claims priority, application Sweden, Oct. 12, 1973, 7313868
Int. Cl.² G01B *11/10*
U.S. Cl. 356—159 **2 Claims**



1. Apparatus for contactless measuring of dimensions of a moving object, whereby the contours of the object in one dimension by means of an optic system are arranged to be projected onto an opto-electrical member, the output signal of which is a measure of the dimension to be defined, comprising an optical system having a first part comprising at least one cylindrical lens, the cylindrical axis of which is at right angles to the dimension to be defined and a slit aperture located between said lens and an opto-electrical means, said slit aperture being so arranged that substantially only beams perpendicular to the dimension to be defined pass through said slit aperture, the distance between said opto-electrical means and said slit aperture being adjusted so that the projection of the object falls in the active area of said opto-electrical means.

3,947,130
METROLOGICAL TV MICROSCOPE

Samuel Anderson Procter, Minneapolis, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Dec. 3, 1974, Ser. No. 529,149
Int. Cl.² G01B *11/02*
U.S. Cl. 356—167 **13 Claims**

1. In apparatus of the type comprising an optical system projecting a focussed image of a field of view, and an image processor comprising

a. at least first and second light sensitive strips on which at least a part of the image falls, each producing along each strip a signal indicating variations along the strip in a preselected quality of light impinging thereon,

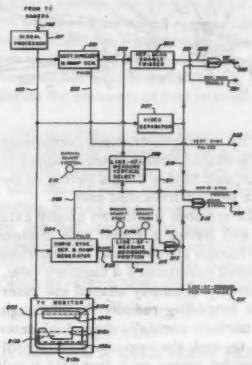
b. a scanner receiving first and second initiate signals and responsive thereto scanning at a preselected speed along the first and second strips respectively, the light variations, and producing a scan signal encoding the variations in the light quality adjacent the point of scan, and

c. a scan controller issuing first and second initiate signals, an improvement for providing a signal indicating the exact distance between third and fourth marks positioned in the field of view to cause focussed images thereof to fall on the second strip and cause detectable variations in said preselected quality of the light, comprising:

a. a reference object having thereon and spaced a preselected distance apart, first and second marks causing said detectable variations in said preselected quality of the light and located within the image path to cause a focussed image of each mark to fall on the first strip;

b. a detector receiving the scan signal and producing first through fourth mark signals occurring at substantially equal times after occurrence of each scan signal variation caused respectively by the first through fourth marks; and

c. timing means receiving the mark signals and producing a first time signal encoding the time span between the first and second mark signals and a second time signal encoding the time span between the third and fourth mark signals;

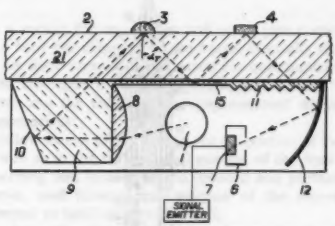


wherein said preselected distance between the first and second marks is a dimension producing a time span encoded in the first time signal substantially equaling the time span encoded in the second time signal when the spacing between the third and fourth marks is a preselected known distance.

3,947,131
WINDSHIELD SOIL DETECTOR

Gerhard Karl, 8701 Frickenhausen, Uppental 4, Germany

Filed Nov. 4, 1974, Ser. No. 520,848
Int. Cl.² G01N *21/48*
U.S. Cl. 356—209 **6 Claims**



1. A glass pane soil indicator for detecting water, dirt or the like on the exposed surface of the pane comprising a portion of said pane having exposed and unexposed surfaces normally free of any substance, a light source, a photometer, means for directing the light from said source through the unexposed surface of the pane to the exposed surface, an optical system for directing light returned through the pane to pass to the photometer, said photometer being arranged to receive only light leaving the exposed pane surface at the angle of total reflection, and means responsive to the output of the photometer for indicating the condition of the exposed glass surface.

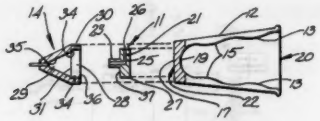
3,947,132
FINGER TIP WRITING INSTRUMENT

Joseph Fox, 307 Tomahawk Ave., Black Mountain, N.C. 28711

Continuation-in-part of Ser. No. 502,872, Sept. 3, 1974, abandoned. This application Jan. 31, 1975, Ser. No. 546,134

Int. Cl.² B43K *23/00*

U.S. Cl. 401—7 **15 Claims**



1. A finger tip writing instrument comprising:

a. a conically shaped holder means adapted to fit on the end of a finger, said holder means having an open finger inlet end and a smaller truncated end,

b. a disc-like member having an axially extending tubular element and having a radial hole communicating with said axial tubular element, said tubular element and radial hole together constituting a capillary tube, and

c. a substantially conically shaped ink reservoir having a vent hole extending radially therethrough, the apex of said substantially conically shaped ink reservoir engaging a writing tip and, the opposite end thereof being affixed to said holder means such that said tubular element of said disc-like member extends partially therein and said vent hole is in alignment with said radial hole in said disc-like member.

3,947,133
AUTOMATIC PENCIL

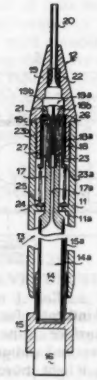
Hidehira Kageyama, No. 234, 4-1-3, Ooshima, Koto, Tokyo, and Takahiko Suzuki, 22-2, Yatsushima-cho, Aza, Ishida, Ooaza, Kawagoe, Saitama, both of Japan

Filed Apr. 10, 1975, Ser. No. 566,834

Claims priority, application Japan, Apr. 25, 1974, 49-47319[U]

Int. Cl. B43k *21/02, 21/16, 21/22*

U.S. Cl. 401—54 **6 Claims**



1. An automatic pencil comprising:

a. an outer tube to be held by the user;

b. a holding means having an inner tube coaxially inserted in said outer tube and movable in the axial direction relative to said outer tube;

c. said inner tube having a plurality of chucking portions to chuck a lead piece disposed therebetween;

d. a guide means having a tubular member connected to said outer tube for guiding the lead piece chucked by said chucking portions and defining a space;

e. a ring having a bore through which said chucking portions project and disposed in said space in a manner to be movable in the axial direction;

f. a movable member provided for pushing said ring forward to cause said chucking portions to chuck the lead piece;

g. means for urging said movable member forward and said inner tube backward; and

h. a push-button for pushing said holding means forward.

3,947,134
DEVICE FOR DISPENSING MOISTENED HOT CLEANSING TISSUES

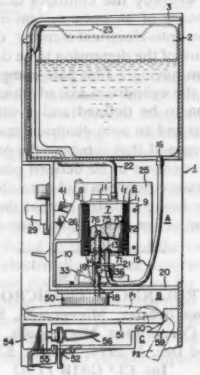
Yonekichi Ogawa, Tokyo, Japan, assignor to Maruwaseiko Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 24, 1975, Ser. No. 552,720

Claims priority, application Japan, May 27, 1974, 49-58720; July 18, 1974, 49-81719

Int. Cl.² B05B *13/02;* **B05C** *5/02*

U.S. Cl. 401—118 **7 Claims**



1. A device for serially dispensing cleansing tissues or the like which have been moistened to a predetermined degree with heated water, comprising a frame, a reservoir mounted within said frame for the storage of relatively cool water, a hot water heater positioned in said frame below said reservoir adapted to receive cool water from said reservoir and to discharge water therefrom heated to a predetermined temperature, a flexible water supply tube connecting said reservoir and said hot water heater, a flexible hot water discharge tube being mounted in said hot water heater with the upper end thereof projecting thereinto a preselected distance, a hot water supply chamber located in said frame below said hot water heater and the lower end of said hot water discharge tube extending into said chamber, an oscillatable throttling means being mounted within said frame adapted to oscillate between a first position whereby it constricts the passageway of said hot water discharge tube to prevent the discharge of hot water therefrom and a second position whereby it constricts the passageway of said water supply tube to prevent the flow of relatively cool water from said reservoir to said hot water heater, and means for storing a plurality of cleansing tissues and for moving same in a path within said frame whereby they are moistened by the hot water before being dispensed.

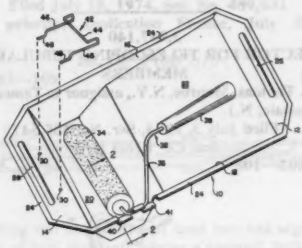
3,947,135
PAINT TRAY

Gary D. Hawk, Iola, Kans., assignor to Harding Development Co., Clearwater, Fla.

Continuation-in-part of Ser. No. 380,603, July 19, 1973, Pat. No. 3,870,420. This application Feb. 13, 1975, Ser. No. 549,639

Int. Cl.² B44D *3/12*

U.S. Cl. 401—121 **1 Claim**



1. In a paint tray for use with a paint roller or the like, said paint roller having a bent wire rod supporting a paint applying portion at one end and having a handle at the other end, said paint tray including substantially coplaner front and rear edges, a paint well adjacent to and extending vertically below said rear edge for storing a supply of paint, and an integral inclined surface tapering upwardly from said paint well to said front edge for rolling excess paint off said paint applying portion whereby execes paint flows into said well, said paint tray further including a peripheral outwardly extending lateral flange substantially coplaner with said front and rear edges, the improvement comprising:

a small relatively thin support member defining a slot for retaining said bent wire rod and said flange together for supporting the paint applying roller above the paint well,

said support member being formed by said paint tray flange having at least one portion thereof bent to form a second flange, said flange and said second flange defining said slot therebetween for frictionally retaining said bent wire rod therein.

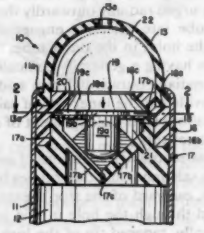
3,947,136
PRESSURE CONTROL MEANS FOR FLUID APPLICATOR

Patrick J. Adams, Ada, Ohio, assignor to Artex Hobby Products, Inc., Lima, Ohio

Continuation of Ser. No. 424,630, Dec. 13, 1973, abandoned, which is a continuation of Ser. No. 230,947, March 1, 1972, abandoned. This application Oct. 4, 1974, Ser. No. 512,158

Int. Cl.² B43K *5/02*

U.S. Cl. 401—188 A **2 Claims**



1. In a fluid applicator having a hollow elongated body defining a chamber for containing a quantity of fluid, said body ending in a tip for the application of said fluid, the improvement comprising:

a. a deformable bulb connected to the other end of said body;

b. internal valve means within said body in communication with said bulb and said chamber, said valve means in turn comprising

i. a unitary compressible body section adapted to be inserted into the elongated body and held in position therein;

ii. flexible lips integrally-formed as part of said body section which lips are angularly-disposed to each other and have bevelled ends which engage substantially in a plane in the closed-valve position and which ends separate from said plane in the open-valve position;

iii. said compressible body and said flexible lips cooperating to define the elements of said internal valve means; and

c. a second valve member provided between said compressible body and said bulb, said second valve member having means for sealing against return pressure of air from said chamber, said second valve member further including a stem extending toward said valve lips, the end of said stem being disposed adjacent to said lips, said second valve member when moved sufficiently toward said first valve member causing the valve stem thereof to force the valve lips arart to relieve pressure within said chamber.

3,947,137
SOCKET FOR A BALL POINT PEN

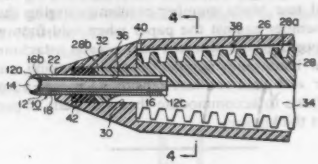
Jiro Hori, Kure, Japan, assignor to The Sailor Pen Co., Ltd., Tokyo, Japan

Filed Sept. 16, 1974, Ser. No. 506,341

Claims priority, application Japan, Dec. 18, 1973, 48-145685[U]

Int. Cl. B43k *7/02*

U.S. Cl. 401—217 **6 Claims**



1. In a socket for use with a ball point pen comprising a barrel, a feed bar disposed in the barrel coaxially therewith, and an air duct formed in the barrel for communication between the atmosphere and a control chamber defined between the barrel and the feed bar, the improvement wherein said socket comprises:

a. a hollow sleeve firmly held in the tip portion of the barrel as well as in the forward end portion of the feed bar;

b. a writing ball located in the forward end portion of the sleeve, said forward end portion of the sleeve being crimped to hold said writing ball;

c. a rod member inserted into the sleeve with the forward end thereof pressed against the writing ball, said rod member having at least one flat plane on the outer periphery thereof;

d. at least one ink conducting chamber defined between the inner wall of the sleeve and the at least one flat plane; and

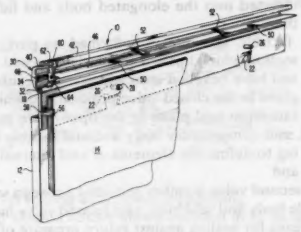
e. a communication chamber formed in the sleeve for direct communication between the ink conducting chamber and the atmosphere, at least part of said communication chamber being exposed to the atmosphere so as to expel air filled in the conducting chamber directly to the atmosphere due to ink being being brought into the conducting chamber.

3,947,138

PAPER PAD CLAMPING FIXTURE

Raymond H. Eshelman, St. Petersburg, Fla., assignor to Oravisual Company, Inc., St. Petersburg, Fla.

Filed Nov. 27, 1974, Ser. No. 527,765
Int. Cl.² B42F 1/00
U.S. Cl. 402—69 **10 Claims**



1. A clamping fixture for hanging and clamping a heavy stack of large sheets of paper against the front surface of an upright support board in condition to be torn off one-by-one comprising:

a back support member adapted to be supported on the top edge of said upright support board;

a clamping member pivotally attached to said support member;

a tear blade member pivotally attached to said clamping member and adapted to swing with said clamping member when the latter is swung about its pivotal attachment to open said clamping fixture for the insertion of paper therein, said tear blade member engaging the paper and clamping the same against the front surface of the upright support board when the clamping member and tear blade are again swung in a closed position; and

resilient tensioning means between said clamping member and said tear blade member resiliently urging the tear blade member against the paper when said fixture is in closed position and wherein said pivotal attachment of said tear blade and member to said clamping member together with said resilient tensioning means automatically adjusts to accommodate sheets or pads of paper of different thicknesses.

3,947,139

LIGHT SOURCES EMPLOYING UNIVERSALLY ADJUSTABLE BALL AND SOCKET JOINTS

Richard E. Feinbloom, New York, N.Y., assignor to Designs For Vision, Inc., New York, N.Y.

Division of Ser. No. 462,616, April 22, 1974. This application Mar. 25, 1975, Ser. No. 561,857
Int. Cl.² F16C 11/06
U.S. Cl. 403—90 **3 Claims**

1. In a ball and socket joint, said socket having an internal groove about the inner periphery of a ball accommodating aperture, friction means in said socket for holding said ball in any desired position of movement of said ball, said means including a elastomeric beveled "O" ring having a continuous engaging surface which is seated and positioned in said groove to coact with and engage the central periphery of said ball for exerting a frictional force on the peripheral surface of said ball for maintaining said ball in all positions of adjustment, with said beveled edge of said "O" ring permitting said full range of adjustable positions; while providing a full 360° rotational motion.

3,947,140

CONNECTOR FOR TELESCOPING TUBULAR STICK MEMBERS

Morton I. Thomas, Monroe, N.Y., assignor to Temco Products, Inc., Passaic, N.J.

Filed July 3, 1974, Ser. No. 485,547
Int. Cl.² F16D 1/12
U.S. Cl. 403—108 **2 Claims**

1. An adjustable telescopic connection for tubular construction hospital and patient appliances and equipment, such as crutches, canes, walkers and commodes, said adjustable telescopic connection comprising:

a. inner and outer telescopically joined, slidably adjustable, tubes

b. a plurality of spaced sharp edged holes formed in the outer of said tubes, longitudinally thereof, each hole being defined by a peripheral sharp edge at substantially right angles to the length of the outer tube,

c. a hole formed in the inner of said tubes for selective registration with the holes in the outer tube,

d. the diameter of the hole in the inner tube being larger than the diameter of the holes in the outer tube,

e. a radially extending lock button mounted in the inner tube and spring-urged radially outwardly through the hole in said inner tube into selective engagement with said sharp edge of the holes in the outer tube,

f. said lock button having a generally conically, tapered tip which extends radially outwardly from said inner tube,

g. stop means provided at the inner end of said lock button to prevent radial outward dislodgement of said lock button from said inner tube,

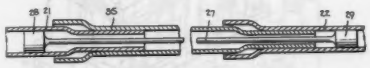
h. the relative cross-sectional dimensions of said lock button and the holes in said inner and outer tubes being such that the lock button, outward of the stop means, is freely and closely received through the hole in said inner tube, the generally conically, tapered tip of the lock button being received in locking engagement with the peripheral edge which defines the selected hole in the outer tube, impressing an outward spring bias on said outer tube, said stop means being out of engagement with the inner tube,

i. the spring bias being sufficiently strong to effect a movement dampening engagement between said tubes along the portions thereof opposed from the holes.

3,947,141
FISHING ROD HAVING ELASTIC FERRULE CONNECTIONS

Jacques G. Casset, Granada, Spain, assignor to Strateurop S.A., Granada, Spain

Filed July 18, 1974, Ser. No. 489,531
Claims priority, application France, July 20, 1973, 73.26972
Int. Cl.² F16B 7/10
U.S. Cl. 403—109 **16 Claims**

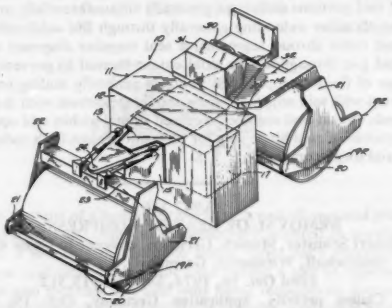


1. A fishing rod comprising at least two rod segments, an end of one of said segments having a tapered, hollow extension dimensioned to snugly fit within a hollow mating, tapered end of a second segment, said extension having a first surface wedging against the inner tapered surface of said mating end, and a second surface on said mating end providing a radial clearance between the end of said first segment and said mating end; and elastic connector means extending between said segments and having one end fastened within said one segment and the other end fastened within said second segment, said means taking up any play between said extension and said mating end and permitting said segments to be folded one upon the other.

3,947,142
ARTICULATED PAVEMENT COMPACTING MACHINE

Harry H. Takata, Golden Valley, and Norman A. Bauer, Watertown, both of Minn., assignors to Raygo, Inc., Minneapolis, Minn.

Filed Feb. 6, 1975, Ser. No. 547,731
Int. Cl.² E01C 19/26
U.S. Cl. 404—126 **10 Claims**



1. A surface compacting machine of the type having individually and separately steerable front and rear drums and a chassis supported by said drums, characterized in that:

A. the chassis comprises a main section and a front section and means connecting said sections for and constraining them to rocking motion relative to one another about a horizontal axis that extends fore and aft of the machine;

B. a front yoke embracing the front drum and a rear yoke embracing the rear drum, each drum being freely rotatably connected to the arms of its yoke for rotation about the axis of the drum, and the crossbar of the yoke overlying the top of the drum;

C. front pivot means connecting the crossbar of the front yoke with the front section of the chassis, to provide for steering motion of the front drum with respect to the chassis,

said pivot means constraining all relative motion between the front yoke and the front section of the chassis to rotation about an axis that is fixed with respect to the front section of the chassis and perpendicularly intersects the axis of the front drum symmetrically thereof, and also intersects said fore and aft horizontal axis;

D. rear pivot means connecting the crossbar of the rear yoke with the main section of the chassis to provide for steering motion of the rear drum with respect to the chassis,

said rear pivot means constraining all relative motion between the rear yoke and the main section of the chassis to rotation about an axis that is fixed with respect to the main section of the chassis and perpendicularly intersects the axis of the rear drum symmetrically thereof, and also intersects said fore and aft horizontal axis; and

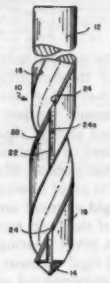
E. separate operator controlled power steering means for imparting steering motion in either direction to each of the drums independently of one another or simultaneously, whereby said drums can be disposed with their axes at different angles with respect to one another and also in laterally offset relationship with their axes parallel,

said power steering means being operatively connected with and reacting between each of said yokes and the chassis section to which it is connected, so that said power steering means does not interfere with the freedom of the drums to rock with respect to one another about said fore and aft horizontal axis.

3,947,143
PRINTED CIRCUIT DRILL

Michael Gulla, Sherborn, Mass., assignor to Shipley Company, Inc., Newton, Mass.

Filed July 15, 1974, Ser. No. 488,275
Int. Cl.² B23B 51/02
U.S. Cl. 408—230 **8 Claims**



5. A twist drill according to claim **1**, wherein the width of the grooves and lands at right angles to the inclination of the grooves and lands are substantially equal.

3,947,144
COUNTERWEIGHTED MECHANICAL BOOM

Barry Elliott, 18320 W. Clifftop Way, Malibu, Calif. 90265

Filed Aug. 26, 1974, Ser. No. 500,760
Int. Cl.² B23B 47/00; B23C 9/00; B66C 23/72; F16M 11/04
U.S. Cl. 408—235 **16 Claims**

1. An articulated swivelling boom combination adapted to carry on one of its extremities a device and to enable said

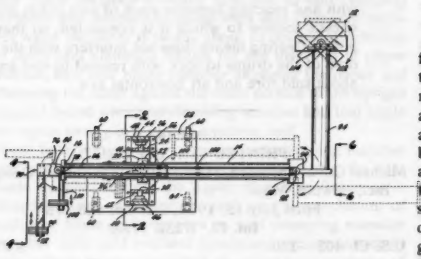
device to be moved about smoothly in any direction of 360° in a given plane within a predetermined area, said boom combination comprising:

A. a base, said base including a supporting platform and first pivot bearing means projecting perpendicularly with reference to said platform, said bearing means being rotatable about a substantially vertical axis in a predetermined arc of rotation;

B. an elongated rigid member, said member being mounted at a point intermediate its extremities on said pivot bearing means thereby to be pivotable in a plane normal to said axis, said member having in the vicinity of one of its two extremities a further second pivot bearing means and, in the vicinity of the other of its two extremities a third pivot bearing means, each of said second and third pivot bearing means being rotatable about an axis parallel to the axis of rotation of the first pivot bearing means;

C. a first rigid elongated element, one end of said element being rotatably mounted on said member by the second pivot bearing means to be rotatable about the axis of said second bearing means, said first rigid element extending in a first direction from said second bearing means, and the other end of said element having means to carry said device;

D. a second rigid elongated element, one end of said second element being rotatably mounted on said member by the third pivot bearing means to be rotatable about the axis



of said third bearing means, said second rigid element extending from said third bearing means in a second direction, and the other end of said second element carrying counterweight means, the end of said member in the vicinity of which said second rigid element is mounted being counterweighted to equalize any static weight differential between that portion of said rigid member extending from the first pivot bearing means and rotatably carrying the first rigid element and said device, and the remaining portion of the rigid member extending oppositely from the first pivot bearing means and rotatably carrying the second rigid element, and said second rigid element being counterweighted at a point remote from the third pivot bearing means to equalize any change in weight distribution with reference to the second pivot bearing means which may be occasioned by rotation of the first rigid element carrying said device about said second pivot bearing means;

E. two circular gear means, one of said circular gear means being secured to rotate with said first rigid element, the other of said circular gear means being secured to rotate with said second rigid element, each of said gear means being disposed coaxially with the axis of rotation of its respective rigid element about its respective pivot bearing means; and

F. means connecting both of said gear means for coordinated rotation.

3,947,145

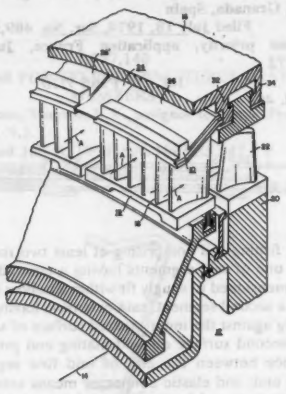
GAS TURBINE STATIONARY SHROUD SEALS

Frank Michel, Swarthmore, and Egidio J. Ruffini, Havertown, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 7, 1974, Ser. No. 513,001

Int. Cl.² F01D 9/02, 9/04

U.S. Cl. 415—217 **3 Claims**



1. A seal structure for controlling leakage of hot motive fluid between adjacent stationary shroud segments in a gas turbine comprising: A turbine casing having at least one blade ring disposed within said casing, said blade ring defining radially inwardly projecting members, said members having axially opening opposed grooves, an annular array of stationary blades supported on their radially outer ends by a plurality of arcuately formed outer shroud segments and supported on their inner ends by a plurality of arcuately formed inner shroud segments; said outer shroud segments having axially opposed ends generally snugly received within said opposed grooves for supporting said blades and disposed therein so as to have a circumferential gap between adjacent shroud segments providing spatially separated facing end portions; each of said portions defining a generally circumferentially projecting shoulder extending generally through the axial extent of said outer shroud segments; a seal member disposed across said gap throughout the axial extent thereof to prevent leakage of fluid therepast and being in generally sealing engagement with said adjacent facing shoulder portions with the axial ends of said seal member received snugly within said opposed grooves of said blade ring for restraint against both radial and axial displacement.

3,947,146

REMOVAL OF HEAT OF COMPRESSION

Robert Schuster, Munich, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Oct. 16, 1974, Ser. No. 515,312

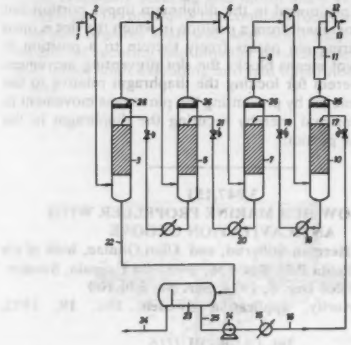
Claims priority, application Germany, Oct. 19, 1973, 2352561

Int. Cl.² F04D 7/00

U.S. Cl. 415—1 **6 Claims**

1. In a process which comprises compressing a gas in a plurality of compression stages, after each compression stage cooling the compressed gas by direct contact with a liquid cooling medium and removing resultant warmed liquid from said gas, the improvement comprising the steps of providing a closed liquid cooling medium cycle, pressurizing the liquid cooling medium and injecting the same into direct heat exchange with the gas compressed from the last pressure stage of the plurality of stages, the thus-warmed liquid cooling

medium then being withdrawn and cooled by indirect heat exchange, the resultant recooled liquid cooling medium being thereafter injected into the gas compressed by the stage preceding the last pressure stage, and when more than two compression stages are employed in said plurality of compression stages, repeating the aforesaid steps until the heat of compression produced resulting from the first compression stage of the gas has been transferred to the liquid cooling medium in direct heat exchange contact, and pressurizing said liquid cooling medium and cooling the same by indirect heat exchange and recycling the resultant cooled pressurized liquid cooling medium into direct heat exchange contact with the gas of the last compression stage.



3,947,147

STATOR OF HYDRAULIC MACHINE WITH THE END-FACE SEALING OF VANES

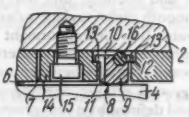
Valentina Vasilievna Loktaeva, prospekt Prosveschenia, 104, kv. 344; Vitaly Viktorovich Vikhirev, Svetlanovsky prospekt, 101, kv. 278, and Gleb Stepanovich Schegolev, ulitsa Sinyavinskaya, 12/49, kv. 29, all of Leningrad, U.S.S.R.

Filed Sept. 27, 1974, Ser. No. 510,133

Claims priority, application U.S.S.R., Apr. 8, 1974, 2009028

Int. Cl.² F01D *17/14, 11/00*

U.S. Cl. 415—113 **6 Claims**



1. In a stator of a hydraulic machine, a pair of opposed rims spaced from each other and respectively situated in parallel planes, a plurality of rotatable stator vanes each extending between said rims, each stator vane having a pair of opposed coaxial end journals and said rims being respectively formed with holes in which said journals are turnable, said vanes being rotatable with respect to said rims between an open position where liquid can flow between said vanes and a closed position where said vanes engage each other, each vane having a pair of opposed end faces respectively situated adjacent but spaced slightly from said rims, and said rims being respectively formed with elongated grooves extending from one hole to the next of each rim and said grooves being respectively aligned with said end faces of said vanes when the latter are in their closed positions, a plurality of non-metallic sealing gaskets respectively situated in said grooves and extending along the entire length thereof, said gaskets extending outwardly beyond said grooves into engagement with said end faces of said vanes, when the latter are in their closed positions, said rims carrying at said grooves retaining means for retaining said gaskets in said grooves while freeing said gaskets for pressing against said end faces of said vanes to prevent liquid from passing between said rims and end faces of said vanes when the latter are in their closed positions, said rims respectively having at innermost parts of said grooves, innermost groove surfaces spaced from said gaskets, and a plurality of elongated sealing members narrower than said gaskets respectively situated between and in engagement with said innermost surfaces of said grooves and said gaskets and extending longitudinally along said gaskets along the entire length thereof for preventing liquid which reaches the space between said innermost surfaces of said grooves and said gaskets from leaking through the latter space beyond said sealing members wherein liquid under pressure seeks to flow from the high pressure side toward the other side of each groove when said vanes are in their closed positions, and said gaskets each being formed at said high pressure side of each groove with at least one through-passage providing for flow of liquid under pressure into the space between each gasket and said innermost surface of each groove into engagement with said sealing member for pressing each gasket on one side of said sealing member toward an end face of a vane.

3,947,148

FAN ASSEMBLIES

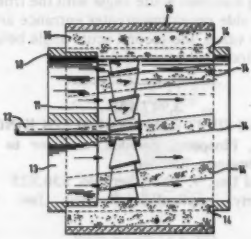
Paul Holt, Rugby, England, assignor to Chrysler United Kingdom Limited, London, England

Filed Nov. 26, 1974, Ser. No. 527,261

Claims priority, application United Kingdom, Dec. 27, 1973, 59802/73

Int. Cl.² F04D *29/66*

U.S. Cl. 415—119 **9 Claims**



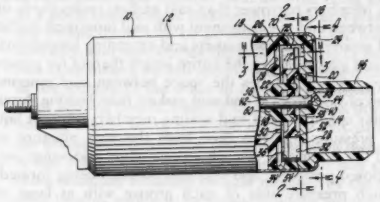
1. A fan assembly comprising a duct, an axial flow fan located within the duct and including rotor blades having outer tips, the wall of the duct having a plurality of radial apertures circumferentially spaced around at least the part of the duct encircling the fan, an acoustic absorption material encircling said part of the duct and having projecting portions extending radially inwardly through the apertures into the duct towards the fan axis, the projections terminating in radially inwardly directed end faces which lie in the path of rotation of the periphery of the fan in a manner to provide a minimum clearance between the projections and the tips of the rotor blades of the fan.

3,947,149

SUBMERGED FUEL PUMP WITH BEVEL SIDED IMPELLER BLADES

Daniel C. MacManus, Owosso, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 1, 1974, Ser. No. 519,836
Int. Cl.² F04D 29/24
U.S. Cl. 415—213 T 2 Claims



1. A peripheral fuel pump assembly comprising, in combination:

a casing having confronting spaced-apart sidewalls defining an impeller raceway with an outer annular channel and having confronting side and peripheral stripper abutments in the annular channel and inlet and outlet ports positioned one in each sidewall adjacent to and on opposite sides of the side and peripheral stripper abutments and communicating with the annular channel; and

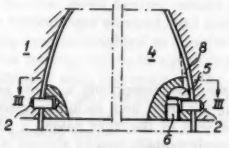
an impeller revolvable in the raceway, the impeller having a hub and a series of vanes radially extending from the hub into the annular channel in peripherally spaced relationship to allow lateral fluid flow therebetween, each vane having front and rear sides in the direction of impeller rotation parallel to the impeller rotational axis, an axial outlet side forming a first acute angle with the rear side, which first acute angle is of such substantial size that the axial outlet side imparts to the fuel a substantial axial component of momentum toward the outlet, and an inlet side forming a second acute angle with the front side, the angled inlet side providing greater entrance area for fuel between the vanes, the second acute angle being equal in size to the first.

3,947,150

AXIAL TURBINE SPLIT DIAPHRAGM LOCKING DEVICE

Paavo Lohonen, Finspong, Sweden, assignor to Stal-Laval Turbin AB, Finspong, Sweden

Filed Dec. 9, 1974, Ser. No. 530,825
Claims priority, application Sweden, Jan. 15, 1974, 7400460
Int. Cl.² F01D 9/00
U.S. Cl. 415—219 R 6 Claims



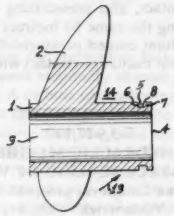
1. In an axial turbine having a split housing including an upper and a lower portion, a rotor having turbine wheels and diaphragms between the turbine wheels, the diaphragms being divided into two portions, each portion being secured in respective upper and lower turbine housing portions, the improvement comprising means for conveniently removably securing the diaphragm upper portion in the housing upper portion comprising securing pin means positioned within the housing on each side thereof, recess means located on opposite sides of the periphery of the diaphragm upper portion, at least one of the recess means extending in the form of a slot means for permitting the corresponding securing pin means to pass freely therein when inserting and removing the diaphragm upper portion in the housing and locking pivot means permanently positioned in the diaphragm upper portion slot for pivotal movement from a position in which the slot is open and the securing pin passes freely therein to a position in which the pivot means blocks the slot preventing movement of the pin therein for locking the diaphragm relative to the securing pin means by preventing the pin means movement in the slot means and thereby securing the diaphragm in the housing upper portion.

3,947,151

HOLLOW HUB MARINE PROPELLER WITH ANTICAVITATION GROOVE

Karl Gustav Herman Stillerud, and Allan Ohman, both of c/o AB Volvo Penta P.O. Box 136, S-751 04 Uppsala, Sweden

Filed Dec. 6, 1974, Ser. No. 530,160
Claims priority, application Sweden, Dec. 19, 1973, 7317119
Int. Cl.² B63H 1/16
U.S. Cl. 416—93 A 16 Claims



1. A marine propeller having a hub with a hollow interior passage terminating at a rearwardly located discharge opening for passage of exhaust gases into the water and with a plurality of propeller blades extending outwardly from said hub spacedly forwardly of said opening, said hub rearwardly of said blades having a smooth outer surface extending in the direction of normal water flow during straight ahead high speed propulsion, said propeller being characterized by a hub-girdling groove disposed spacedly between said blades and said rearward opening, said groove opening outwardly through said hub surface and defined by a rear groove wall, said groove having a bottom located inwardly of said surface and said rear wall extending outwardly from the bottom of said groove toward said surface at an angle with respect to the hub axis not greater than 90° as measured in a forward direction.

3,947,152

PRINTING PRESS CENTRIFUGAL PUMP ASSEMBLY

Joseph Ross, Brooklyn, and Ernest Frederick Fuchs, Middle Village, both of N.Y., assignors to Ace Envelope Manufacturing Corporation, New York, N.Y.

Filed July 1, 1974, Ser. No. 484,429
Int. Cl.² F04B 39/14
U.S. Cl. 417—360 26 Claims

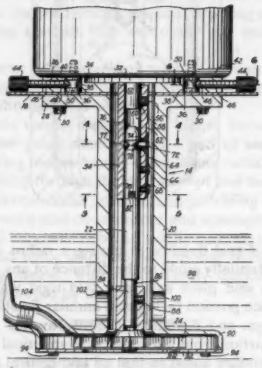
1. A centrifugal pump apparatus comprising

a motor assembly, and

an impeller assembly,

said motor assembly including a shaft mounted for rotational movement,

said impeller assembly comprising,
a housing having an upper portion
and a lower portion,
a shaft, and
an impeller,
coupling means disposed within said upper housing portion for releasably securing said motor shaft to said impeller shaft and for providing concomitant rotational movement of said impeller shaft with said motor shaft,
means for securing said impeller to said impeller shaft,
said motor shaft extending into said upper housing portion, and



said coupling means including alignment means for longitudinally and laterally aligning said impeller within said lower housing portion and for positioning said motor shaft and said impeller shaft in coaxial alignment,
said coupling means including a sleeve fixedly secured to said motor shaft and a drive member connected to said impeller shaft,
said sleeve including a drive engaging member therein, and
said drive engaging member engaging said drive member to provide said concomitant rotational movement.

3,947,153

LUBRICATED THRUST BEARINGS FOR PUMP AND MOTOR UNITS

Heinz-Bernd Matthias; Christian Klepp, both of Frankenthal, and Günter Koll, Frankenthal-Studernheim, all of Germany, assignors to Klein, Schanzlin & Becker Aktiengesellschaft, Frankenthal, Palatinate, Germany

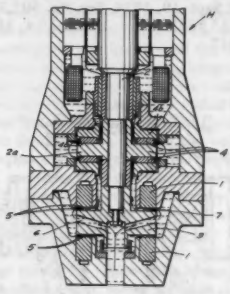
Filed July 17, 1974, Ser. No. 489,421

Claims priority, application Germany, July 18, 1973, 2336488

Int. Cl.² F04B *17/00, 35/04, 39/02;* **F16C** *39/06*

U.S. Cl. 417—365 **10 Claims**

1. In a pump and motor unit, especially in a unit wherein a wet electric motor drives the impeller of a centrifugal pump for circulation of hydraulic fluids at least one of several characteristics of which fluctuates within a wide range, said characteristics including the temperature and pressure of fluids, a combination comprising a liquid-containing housing; a shaft rotatably mounted in said housing; a main thrust bearing in contact with the liquid in said housing and including a disk on said shaft and electromagnet means provided in said housing adjacent to said disk and being energizable to produce an electromagnetic field which normally maintains said disk and said shaft in a predetermined axial position with respect to said housing; and at least one mechanical auxiliary thrust



bearing for said shaft, said auxiliary thrust bearing being in contact with the liquid in said housing.

3,947,154

PUMP ASSEMBLY FOR CIRCULATION OF COOLANT IN BOILING WATER REACTORS OR THE LIKE

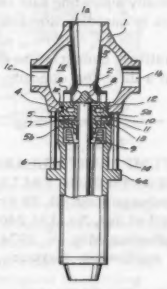
Christian Klepp, Frankenthal; Gunter Koll, Frankenthal-Studernheim, and Waldemar Schwartz, Hessheim, all of Germany, assignors to Klein, Schanzlin & Becker Aktiengesellschaft, Frankenthal, Palatinate, Germany

Filed June 11, 1974, Ser. No. 478,393

Claims priority, application Germany, June 19, 1973, 2331039

Int. Cl.² F04B *39/06*

U.S. Cl. 417—373 **6 Claims**

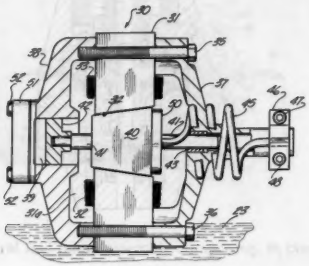


1. A pump assembly, particularly for circulation of highly pressurized fluids whose temperature fluctuates within a wide range, comprising a pump including a body having an opening and a first surface surrounding said opening, and a rotary impeller in said body; a glandless electric motor including a rotary output member for rotating said impeller and a housing having a second surface sealingly engaging said first surface, the area of contact between said surfaces being small and said housing including a heat barrier adjacent to said first surface and having a thin-walled neck portion surrounding said output member, an air-filled space surrounding said neck portion, cooling ribs surrounding said space and coolant-containing compartments at both sides of said space; and elongated expansible coupling elements connected to said body and said housing for biasing said surfaces against each other.

3,947,155
LINEAR COMPRESSOR

Michael K. Bidol, Dearborn Heights, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Sept. 19, 1974, Ser. No. 507,539
Int. Cl.² F04B *35/04*; H02K *7/14*, *33/02*
U.S. Cl. 417—417 **29 Claims**



4. A moving-iron linear-motor compressor comprising, in combination,

a gas pump having a pump chamber,

a magnetic circuit stationarily connected to said pump and having spaced-apart poles defining a substantially conical air-gap, the taper of said gap converging in the direction of said chamber and the center of said gap being coaxial with said chamber,

a rod extending between said spaced-apart poles and having a pumping member carried on one end thereof and a substantially conical armature carried by the central portion thereof for movement between said poles,

bearing means disposed on the side of said air-gap remote from said pumping member and supporting the other end of said rod for axial movement and restraining lateral movement thereof,

means for magnetically activating said circuit thereby driving said armature in one direction toward said chamber, and

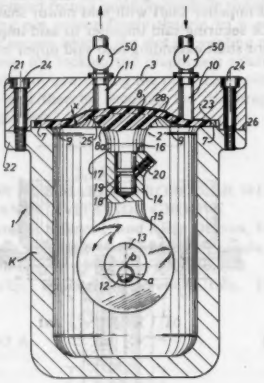
return means operatively connected to said armature drive said armature in a direction opposite to said one direction.

3,947,156
DIAPHRAGM PUMP, PARTICULARLY FOR THE GENERATION OF VACUUM

Erich Becker, Lichtenbergstrasse 80, 78 Freiburg, Germany

Continuation-in-part of Ser. No. 334,940, Feb. 22, 1973, abandoned. This application May 16, 1974, Ser. No. 470,469
Claims priority, application Germany, Mar. 8, 1972, 2211096
Int. Cl.² F04B *45/04*
U.S. Cl. 417—437 **13 Claims**

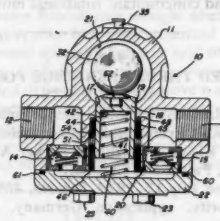
1. A diaphram pump, particularly a vacuum pump, comprising a rigid wall having an inner surface with a central concavely curved spherical surface portion; a diaphragm facing said inner surface of said wall and having an outer peripheral portion fixed to said rigid wall radially outwardly of said central surface portion of the latter, a central substantially rigid portion having a convexly curved spherical surface facing and substantially matching said central concavely curved surface portion of said wall, and an annular flexible portion therebetween, integral with and of the same material as said fixed peripheral portion and said central portion thereof; inlet and outlet ports in said wall radially inwardly of said fixed diaphragm portion and a one-way valve in each of said ports; and drive means rotatable about a fixed axis and a connecting rod connected at one end to said drive means pivotable about a pivot axis spaced from said fixed axis and at the other end to said central portion of the diaphragm for moving said diaphragm between a suction stroke in which said central and flexible portions thereof are spaced from said inner surface of said wall to define with the latter a pumping chamber into which fluid is sucked through said inlet port, and a compression stroke during which fluid is displaced from said pumping chamber through said outlet port, said convexly curved spherical surface of said diaphragm having a radius of curvature which is substantially equal to the distance of any point of said surface from said pivot axis, and said rigid wall having an annular surface portion facing said annular flexible portion of said diaphragm and deviating inwardly toward said flexible diaphragm portion from a hypothetical spherical surface of a radius of curvature equal to that of said central substantially rigid portion of said diaphragm.



3,947,157
SINGLE CYLINDER PUMP

Harry J. Sadler, St. Paul; Ramon Pareja, and John Leschisin, both of Minneapolis, all of Minn., assignors to Lear Siegler, Inc., Santa Monica, Calif.

Filed Nov. 2, 1971, Ser. No. 194,851
Int. Cl.² F04B *21/08*; F16J *15/18*
U.S. Cl. 417—559 **9 Claims**



1. In a reciprocating pump:

a. a body having an inlet port, an outlet port, a cylinder bore formed therein and extending therethrough and having an inner end and an outer end, the bore being arranged to receive reciprocating plunger means therewithin, plunger means disposed within said bore, a rotary drive shaft journaled for rotation in said body and having eccentric means coupled thereto and operatively associated with said plunger for imparting reciprocatory motion thereto, a pumping chamber defined by said cylinder bore and generated by the motion of said reciprocating plunger means;

b. fluid channels formed in said body and extending from said inlet and outlet ports to said pumping chamber and having inlet and outlet valve means disposed therealong and operative to control admission and discharge of fluid to and from said chamber;

cylinder head means secured to said body and isolating said pumping chamber from atmosphere and having a relieved inner surface zone for fluid flow and a projection surface abutting the surface of said body;

d. a crankcase disposed in said body and housing said rotary drive shaft and being disposed at the inner end of said cylinder bore;

e. at least one counterbore being formed along said cylinder bore at the outer end thereof and having a step formed at the base thereof, guide means, packing means and lantern ring means disposed as a stack within said counterbore and operative to guide said plunger in its reciprocatory motion and to seal said plunger between said pumping chamber and said crankcase, said abutting surface being in bearing contact with the outer end surface of said stack;

f. a transverse bore extending radially outwardly from said counterbore at a certain axial position therealong and passing through said body;

g. said guide means and packing means including at least one sleeve guide member and a pair of seal rings, said lantern ring means having at least one radially extending bore passing through the wall thereof and being disposed at said certain axial position and providing communication between said counterbore and atmosphere; and

h. said seal ring means being axially spaced, one from another, and being disposed on opposite sides of said lantern ring means, with the inwardly disposed seal ring being supported by said step.

3,947,158

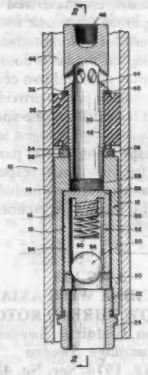
OIL WELL PUMP WITH RESILIENT PLUNGER CUP MEANS

Lonnie L. Gage, R.R. 3 Box 69, Walters, Okla. 73572

Filed May 13, 1974, Ser. No. 469,225

Int. Cl.² F04B *21/04, 39/10*

U.S. Cl. 417—554 **1 Claim**



1. A subsurface well pump comprising a first elongated stationary tubular member in communication with a well fluid reservoir, a second elongated tubular member in communication with the well fluid and concentrically arranged with respect to the stationary tubular member and reciprocal with respect thereto, check valve means disposed within one of said tubular members to provide alternate open and closed positions for the pump during operation thereof, resilient sleeve means disposed around the outer periphery of the said one tubular member and engagable with the inner periphery of the other tubular member, stop means provided on the outer periphery of the said one tubular member and engagable by one end of the resilient sleeve means, adjustment means movably secured to the outer periphery of the said one tubular member and selectively engagable with the opposite end of the resilient sleeve means for applying longitudinal pressure thereto whereby the outer diameter of the resilient sleeve may be varied, and discharge port means provided for the said one tubular member for discharging the well fluid therefrom for elevation of the fluid to the surface of the well during operation of the pump; said check valve means comprising an annular valve seat member removably secured within said one tubular member, cage means supported by the valve seat member, a ball member freely disposed within said cage means and cooperating with the valve seat to provide said open and closed positions for the pump, and stop means carried by the cage means for limiting the movement of the ball during opening of the check valve; and said stop means comprising longitudinally extending stem means centrally disposed within the said cage means and secured thereto, and helical spring means disposed around the stem means and having one end secured thereto and the opposite end suspended freely therebelow for cushioning the engagement of the ball member with the stem means.

3,947,159

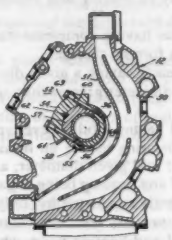
SPLIT BEARING FOR WANKEL ENGINE

Ray A. Mylenek, Royal Oak, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Aug. 6, 1974, Ser. No. 495,692

Int. Cl.² F01C *21/02, 21/04*

U.S. Cl. 418—60 **4 Claims**



1. In a multi-rotor rotary internal combustion engine, the engine having at least two rotor housings and an intermediate housing all in adjacent aligned relationship, an eccentric shaft extending through each of said housings with rotors supported thereon for planetary movement within each of said rotor housings, the combination comprising:

a. an intermediate housing having at least a peripheral end wall and side walls defining a hollow interior, said walls having access openings through which said shaft extends, an integral crescent mounting sector extending between opposite side walls and interrupting the interior of said intermediate housing, said sector having surfaces for directing full 360° flow of said oil circuit throughout the hollow interior of said intermediate housing,

b. means defining an oil flow circuit effective to direct oil received from the motion of said rotors into and through said access openings of said intermediate housing in a rotary spiraling path, and

c. bipartite bearing means secured together as a unit and attached to said sector, said bearing means being spaced from said access openings but providing support for said eccentric shaft extending therethrough, said bearing means being located and supported by said sector in a

manner to continue the full 360° flow of said oil circuit about the bearing as well as the hollow interior of said intermediate housing.

3,947,160

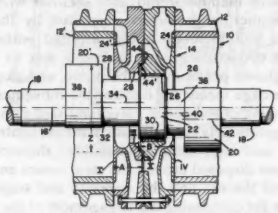
HOUSING AND SHAFT ARRANGEMENT

Arthur L. Black, Corning, and Thomas C. Riggs, Painted Post, both of N.Y., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Nov. 21, 1974, Ser. No. 526,002

Int. Cl.² F01C *21/02*; F16C *35/00*

U.S. Cl. 418—60 **12 Claims**



1. A housing and shaft arrangement, for a rotary mechanism such as a rotary piston engine or the like, comprising:

a one-piece shaft having a longitudinal, rotary axis;

said shaft also having a plurality of eccentrically-disposed rotor journals;

said shaft further having a bearing journal; and

a housing supporting said shaft for rotation; wherein

said housing is subdivided, traverse to said axis, defining thereof a plurality of mating and interfacing one-piece housing portions;

said housing portions having complementary and interfacing circular bores formed therein;

said rotor journals each having a given diameter;

said bores having a diameter greater than said given diameter;

said bearing journal having a full sleeve-type bearing fitted thereabout, said bearing having an inside diameter substantially equal to said given diameter; and

said bearing journal and bearing being engageably mounted in, and being directly supported by, only a single one of said housing portions, via said bore thereof; and

said bearing journal and bearing being wholly radially enclosed by said single one of said housing portions.

3,947,161

COMPOSITE METAL SEALS FOR USE IN ROTARY INTERNAL ENGINES

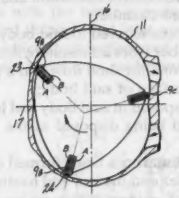
Charles D. McLain, Alton, Ill., assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 347,153, April 2, 1973, abandoned. This application July 22, 1974, Ser. No. 490,779

Int. Cl.² F01C *19/04, 21/00*; F04C *27/00*; F16J *15/00*

U.S. Cl. 418—113 **10 Claims**

1. An improved rotor tip seal for rotary internal combustion engines, of the type having a hollow epitrochoidal chamber defined by a wall and a rotor having a plurality of apexes, the rotor being rotatably and eccentrically mounted within the chamber and having a tip seal located at each apex, comprising: a composite seal of different metal components mounted in the axial direction at each tip of the rotor to seal the space between the rotor tip and the chamber wall, said seal consisting of at least two outer metal strip components, one being the leading seal component and the other being the trailing seal component, the said outer components being adapted cyclically to contact different portions of the said chamber wall, the said component strips being unified by metallurgical bonds at abutting surfaces, and said leading component substantially exceeding said trailing component in wear resistance properties, whereby the said seal components display substantially uniform wear and superior performance during engine operation.



3,947,162

RADIAL SEAL FOR A ROTARY PISTON INTERNAL COMBUSTION ENGINE

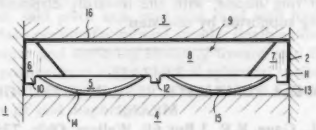
Heinz Lamm, Esslingen-St. Bernhardt, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Sept. 25, 1974, Ser. No. 509,305

Claims priority, application Germany, Sept. 29, 1973, 2349093

Int. Cl.² F01C *19/04*; F04C *27/00*

U.S. Cl. 418—121 **8 Claims**



1. A radial seal for a rotary piston internal combustion engine which comprises radial sealing bar means guided in a groove means of a piston of the engine and forced radially outwardly by spring means, characterized in that the spring means are arranged separate from one another and one behind the other, as viewed in the longitudinal direction of the groove means, the sealing bar means is constructed three-partite and consists of a center part and two corner parts with leg portions, and in that the center part is provided with a substantially centrally arranged leg portion, one spring means each is arranged between said centrally arranged leg portion and the leg portion of the corresponding corner part, said center part includes an inclined surface portion at respective lateral edges thereof, each of said corner portions including a complimentary surface adjoining the respective inclined surface portions of said center part.

3,947,163

SCREW ROTOR MACHINE WITH AXIALLY BALANCED HOLLOW THREAD ROTOR

Hans Kristoffer Olofsson, Huddinge, Sweden, assignor to Atlas Copco Aktiebolag, Huddinge, Sweden

Filed July 18, 1974, Ser. No. 489,942

Claims priority, application Sweden, July 20, 1973, 7310170

Int. Cl.² F01C *1/16*; F04C *17/12*

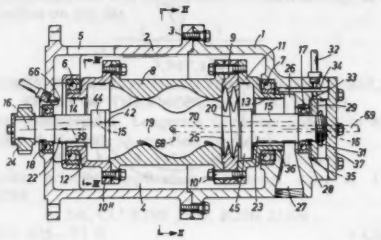
U.S. Cl. 418—203 **6 Claims**

1. In a screw rotor machine for a compressible working medium including a screw cam rotor, a screw thread rotor enclosing the screw cam rotor, the screw cam rotor and screw thread rotor being rotatably journalled in a housing for respective rotation around parallel mutually displaced rotation axes,

the rotors forming chambers for the working medium between their screw cam and screw threads which chambers move from end to end of the rotors during their rotation while changing their volume, the improvement enabling machine operation at a high number of revolutions and a high pressure level with a reduced axial load on the bearings of the screw thread rotor comprising:

a high pressure chamber formed in the housing adjacent the high pressure discharge ends of the rotors, a circular balancing piston secured to the screw cam rotor and exposed to the high pressure in the chamber,

a stepped end part fixed to the screw thread rotor and having a tubular neck of reduced diameter,



the tubular neck forming a shaft projecting into the high pressure chamber and being sealed off from the housing,

the diameter of the balancing piston and of the tubular neck shaft where it is sealed being smaller than the diameter of a circle corresponding to the opening area of the screw thread rotor,

whereby the high pressure in the chamber acting on the balancing piston and on the end part will result in low axial forces on the rotors in opposite directions serving to substantially balance the axial load while maintaining play between the rotors at a minimum.

3,947,164

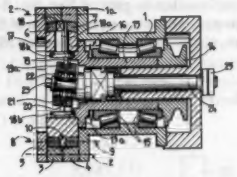
ROTATABLE MACHINE OPERATING AS A COMPRESSOR OR A MOTOR

Jean Stocker, Colombier, Switzerland, assignor to Compresseurs S.A., Colombier, Switzerland

Filed Oct. 18, 1974, Ser. No. 515,837

Int. Cl.² F04C *17/00*

U.S. Cl. 418—233 **7 Claims**



1. A rotatable machine for operation as a compressor or a motor comprising, a stator, a rotor positioned within the stator for rotation, a room defined by the rotor, the room having a longitudinal dimension which is variable, a set of blades carried by the rotor and rotatably mounted thereon, the blades being disposed in said room, control means for impelling oscillating movement to the blades, the movement of the blades being synchronized with the rotation of the rotor such that the blades move as a function of the angular position of the rotor to thereby divide the room into partitions, each partition having the shape of a segment of a crown, a control piece having an annular groove, the control piece being rotatable with the rotor, and a plurality of crank-shafts having crank-pins engaged in the groove for controlling operation of the blades, the control piece being driven by the crank-pins such that there is no slipping friction between the control piece and the crank-pins.

3,947,165

APPARATUS FOR MAKING TUBULAR CONTAINERS

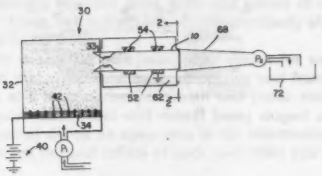
Richard R. Szatkowski, Western Springs, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Division of Ser. No. 304,443, Nov. 7, 1972, Pat. No. 3,833,692.

This application Apr. 24, 1974, Ser. No. 463,599

Int. Cl.² B29C *5/00*; B29D *23/00*

U.S. Cl. 425—3 **7 Claims**



1. An apparatus for making tubular containers with each container having an open end and another end including a shoulder of decreasing diameter and a neck portion, said apparatus comprising:

a. support means;

b. a mold carried by said support means and having an internal surface corresponding to the external configuration of the to-be-formed container including a decreased diameter portion;

c. a supply of powdered polymeric material adjacent said support means and the decreased diameter portion of said mold; and

d. combined pump means and electrostatically charging means adjacent said mold for causing said powdered material to generally pass through said mold, and effecting deposition of a portion of said powdered material on said mold internal surface with a variable thickness.

3,947,166

AGGLOMERATION APPARATUS

Thomas Kleemann, and Willy Rothmayr, both of La Tour-de-Peilz, Switzerland, assignors to Societe D'Assistance Technique Pour Produits Nestle, S.A., La Tour-de-Peilz, Switzerland

Filed Oct. 9, 1973, Ser. No. 404,313

Claims priority, application Switzerland, Oct. 17, 1972, 15185/72

Int. Cl.² A23L *1/00*, *2/00*

U.S. Cl. 425—7 **2 Claims**

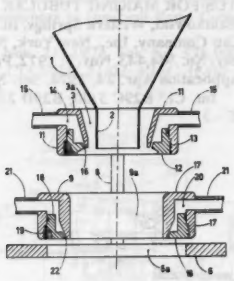
1. Agglomeration apparatus comprising

a hollow annular member having an inner wall extending encirclingly about a central vertical axis and defining a central passage in said member, said central passage terminating at the lower end of said member in an opening extending transverse to said axis,

a cylindrical supply duct received concentrically within said central passage and being spaced radially inwardly from said member inner wall for defining with said member inner wall an annular passage through which a gaseous fluid can be flowed, said hollow member having an outer wall spaced from said inner wall to define an encircling chamber, and

a steam supply duct communicating with said chamber, said chamber terminating in an orifice adjacent said central passage transverse opening, said orifice being disposed such as to direct a current of steam in a course converging with said vertical axis, said orifice extending in an annular

encircling course about said transverse opening, said hollow member comprising complemental inner and outer wall parts moveable axially one with respect to the other for selectively altering the size of said orifice.



3,947,167

VIBRATING PADDLE ASSEMBLY FOR A SLIP FORMER

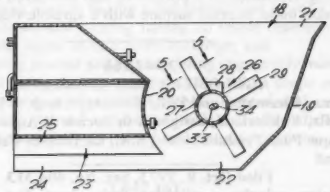
William P. K. Rochfort, 2800 Seventh Ave. North, Fargo, N. Dak. 58102

Filed Nov. 5, 1973, Ser. No. 413,022

Claims priority, application Canada, Nov. 7, 1972, 155825

Int. Cl.² B28B *13/02*

U.S. Cl. 425—64 **9 Claims**



1. A concrete slip former having a hopper with an open bottom and shaping mold extending rearwardly from said open bottom for placing a mixture of concrete in ribbon form on the ground as the slip former travels forwardly thereover and a driven rotatable paddle assembly in said hopper to force the mixture therefrom into the shaping mold, said paddle assembly comprising:

a longitudinally extending hub; means mounting said hub in said hopper for rotation about an axis transverse to the direction of travel of the slip former;

a plurality of arms secured to said hub and radiating outwardly therefrom at positions spaced longitudinally along and circumferentially around the hub;

drive means for rotating said hub; and vibrating means within said hub comprising eccentrically mounted weights rotatably mounted for vibrating at least a portion of said paddle assembly during rotation thereof.

3,947,168

FILM CASTING APPARATUS FOR THE PURIFICATION OF PHOTOGRAPHIC MATERIALS

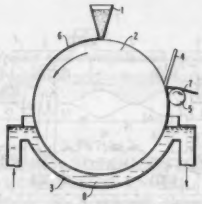
Motohiro Ujihara; Itsuo Fujii, and Yasunori Nagai, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Division of Ser. No. 726,047, May 2, 1968, abandoned. This application July 27, 1970, Ser. No. 64,884

Claims priority, application Japan, May 4, 1967, 42-28388; May 10, 1967, 42-39069[U]

Int. Cl.² B29D *7/02*

U.S. Cl. 425—71 **1 Claim**



1. A desalting apparatus for desalting a photographic emulsion consisting of a rotatable drum having a flat cooling surface, a cooling bath containing cold water and means to flow said cold water through said cooling bath, the lower section of said rotatable drum being immersed in said cold water, a hopper for supplying the photographic emulsion to said flat surface to form thereon a thin film of said photographic emulsion having a thickness of from **30** to **300** microns and scraper means for scraping the gelled and desalted film of the photographic emulsion from said flat surface after passage through said cold water bath, said scraper means consisting of a flexible plastic sheet, and wherein said apparatus further consists of a water supply member disposed above said scraper means to supply fresh water to the end of said scraper.

3,947,169

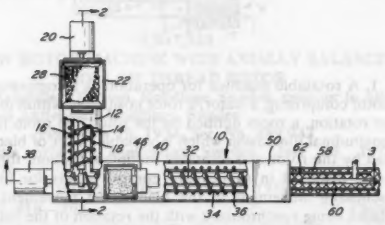
APPARATUS FOR MAKING RODS OR TUBES HAVING A FILTER

Otto J. Wolff, Devon, and Harvey Nungesser, Norristown, both of Pa., assignors to Allied Chemical Corporation, New York, N.Y.

Division of Ser. No. 23,496, March 27, 1970, abandoned, which is a continuation-in-part of Ser. No. 849,267, Aug. 11, 1969, abandoned, which is a continuation of Ser. No. 568,902, July 29, 1966, abandoned. This application May 13, 1974, Ser. No. 469,202

Int. Cl.² B29D *7/20*

U.S. Cl. 425—71 **3 Claims**



1. Apparatus for making an extruded product composed of a thermoplastic material and an abrasive filler, comprising first and second extruder barrels communicating with one another so that the output of the first extruder barrel is di-

rected into the input of the second extruder barrel, an extruder screw in each barrel, the output of said second extruder barrel being greater than the output of said first extruder barrel, motor means for rotating the screws, means for heating the extruder barrels, a first hopper communicating with the inlet end of the first barrel for introducing thermoplastic material to said first barrel, said second hopper communicating with said second barrel downstream from the inlet end of said second barrel for introducing abrasive particles to said second barrel, an extrusion die coupled to the outlet end of the second extruder barrel, whereby said thermoplastic material may be introduced into the first extruder barrel from the first hopper, melted in said barrel, and said abrasive filler may be introduced from the second hopper into the melted thermoplastic material, and the mixture extruded through at least one orifice on the die.

3,947,170

ROTARY FILM BLOWHEAD FOR MAKING TUBULAR FILMS OF THERMOPLASTIC MATERIAL

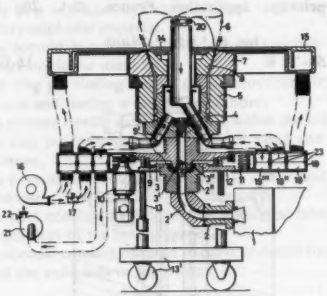
Werner Zimmermann, Lengerich, Germany, assignor to Windmoller & Holscher, Lengerich, Germany

Filed Apr. 3, 1975, Ser. No. 564,909

Claims priority, application Germany, Apr. 5, 1974, 2416758

Int. Cl.² B29F *3/00*; B29D *23/04*

U.S. Cl. 425—72 R **7 Claims**



1. A rotary film blowhead fed centrally with thermoplastic material for making tubular film, comprising film cooling means with interior and exterior cooling rings and air supply connectors, said blowhead being rotatably connected to a stationary extruder, characterised in that the individual corotating air supply connectors are connected to the stationary blowers (16, 21) by segmented relatively rotatable air distributing rings (19, 19', 19'', 19''') which are sealed by sealing elements (23) and of which the portion connected to the blowers (16, 21) is stationary.

3,947,171

APPARATUS FOR PRODUCING PRECAST CONCRETE MEMBERS

Kazuyoshi Yasuda, Tokyo; Tokishige Tsuboi, Machida, and Masashi Sudo, Tokyo, all of Japan, assignors to The Shimizu Construction Co., Ltd., Tokyo, Japan

Filed Dec. 11, 1972, Ser. No. 313,800

Claims priority, application Japan, Dec. 9, 1971, 46-99018

Int. Cl.² B28B *15/00*; F27B *3/18*

U.S. Cl. 425—88 **4 Claims**

1. An apparatus for producing precast concrete members, comprising:

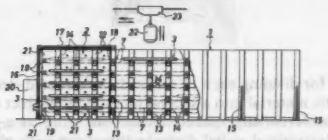
a curing chamber in which concrete is to be cured; said curing chamber having an entrance side facing toward a concrete placing section;

a concrete placing section in which the work for concrete placing in form members is performed; said concrete placing section having an entrance side facing toward said curing chamber side;

a pair of laterally spaced, parallel, vertically extending and vertically oriented frame means which extend longitudinally between and through said curing chamber and said concrete placing section; a plurality of spaced apart vertical layers defined on and extending longitudinally along each said frame means, with corresponding said vertical layers on both said frame means being horizontally aligned;

a respective plurality of form members supporting rollers on every said layer of both said frame means; each of said rollers on one of said frame means being paired with one of said rollers on the other of said frame means defining a plurality of roller pairs; both said rollers of each said pair being horizontally aligned longitudinally along both said frame means;

support means on both said frame means for supporting each said roller near to its respective said frame means and at a location between both said frame means; said support means and said rollers being shaped and positioned to define an open area in the intermediate space between the said rollers of each said roller pair;



a plurality of precast concrete form members; at least one said form member being supported on some of said roller pairs at each said vertical layer; the length, measured in the longitudinal direction along said frame means, of each said form member and the spacing between adjacent said roller pairs on a said layer being coordinated such that each said form member is continuously supported from beneath by at least two said roller pairs as said form member is moved longitudinally along said frame means; the width of each said form member is such that it is supported on both rollers of each said pair it is then being supported upon;

all said support means and said rollers being so shaped and positioned that concrete poured from above said concrete placing section will pass by all said layers of said roller pairs without interference with its passage until the poured concrete falls on a said form member that has been located in said concrete placing section beneath the pouring concrete;

moving means for moving each said form member longitudinally along said frame means and along its respective said layer between said curing chamber and said concrete placing section.

3,947,172

APPARATUS FOR EXTRUDING PLASTIC MATERIALS

Daryl Lester Myers, Lawrenceville, Ga., assignor to Western Electric Company, Inc., New York, N.Y.

Division of Ser. No. 303,435, Nov. 3, 1972, Pat. No. 3,860,686, which is a continuation-in-part of Ser. No. 260,584, June 7, 1972, abandoned. This application June 20, 1974, Ser. No. 481,437

Int. Cl.² B29F *3/10*

U.S. Cl. 425—113 **15 Claims**

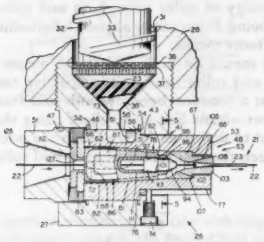
1. Apparatus for extruding a plastic covering around a filamentary core advancing through an extrusion chamber into which a stream of fluent plastic material is forced and

having an extrusion die therein through which the core is passed axially, which comprises:

means for bending the forced stream in a direction parallel to the direction of the advancing core at a first predetermined radial distance therefrom;

means for dividing said bent stream into a first plurality of distinct streams in paths circumferentially spaced around and parallel to the core at said first predetermined radial distance therefrom, each of said streams being of a sufficient length with respect to its cross-sectional size to achieve equal and constant pressures anv velocities at the extremities thereof;

means for directing said first plurality of streams radially inward toward said filamentary core;



means for dividing each of said radially directed streams of plastic material into a second plurality of distinct streams circumferentially spaced around the core at a second predetermined radial distance therefrom with all of the material of each of said plurality of said distinct streams being moved toward said extrusion die, each of said streams being of a sufficient length with respect to its cross-sectional size to achieve equal and constant pressures and velocities at the extremities thereof; and

means for assembling said second plurality of distinct streams of equal and constant pressures and velocities at said die circumferentially around the core.

3,947,173

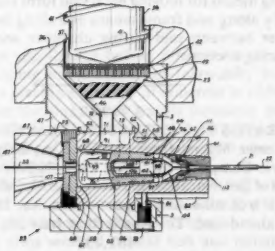
APPARATUS FOR EXTRUDING CONCENTRIC PLASTIC SHEATHS

Timothy Stephen Dougherty, Norcross, Ga., assignor to Western Electric Company, Inc., New York, N.Y.

Division of Ser. No. 288,648, Sept. 13, 1972, abandoned. This application May 28, 1974, Ser. No. 473,990

Int. Cl.² B29F *3/10*

U.S. Cl. 425—113 **8 Claims**



1. An apparatus for forming first and second concentric sheaths of plastic material around a longitudinally moving filamentary core, which comprises:

a single confined passageway through which the core is passed, said passageway forming a tapered die orifice;

means for introducing a first fluent plastic material into said passageway at an entrance section thereof circumferentially around and in the direction of the moving core and ultimately onto the core; and

means for introducing a second fluent plastic material into an intermediate section of said passageway after it has flowed a sufficient distance to achieve a uniform distribution of velocity and pressure, around the periphery of said passageway and in the direction of the flowing first plastic material and the core and ultimately onto the first plastic material, at a sufficient distance from the point of introduction of the first plastic material to have allowed the flow of the first plastic material to have achieved a uniform distribution of velocity and pressure, to form first and second concentric sheaths of plastic material around said core between the intermediate section of the passageway and the exit section thereof.

3,947,174

APPARATUS FOR REPRODUCING PERFORATED SEAMLESS TUBULAR FILMS BY MEANS OF COMPRESSED AIR

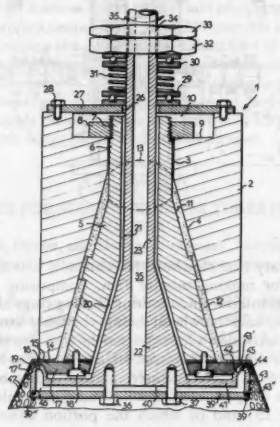
Jean-Claude Hureau, 56, rue du Leon, 78 310 Maurepas, and Jacques Hureau, 18, rue de la Glaciere, 75 013 Paris, both of France

Filed Oct. 2, 1973, Ser. No. 402,827

Claims priority, application France, Oct. 20, 1972, 72.37186

Int. Cl.² B29C *24/00*

U.S. Cl. 425—72 R **16 Claims**



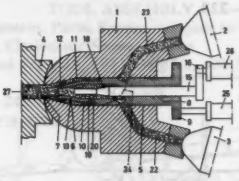
1. An apparatus for producing perforated seamless tubular film having a source of extruded thermoplastic, full-walled, tubular film and a body having means defining a chamber therein and an external tapered surface exposed to the atmosphere over which said thermoplastic, full-walled tubular film travels longitudinally in direct contact therewith during operation, in a direction of increasing diameter, a transverse surface over which the tubular film travels exposed to the atmosphere transverse to said tapered surface, and a transverse surface merging smoothly with said tapered surface immediately upstream of the tapered surface relative to the longitudinal travel of said tubular film, said transverse surface being provided with a first series of openings distributed in a circle on the periphery of said body and communicating with said chamber in said body, means providing a path to said chamber for communicating with a constant-pressure compressed gaseous fluid source, and means for regularly closing said openings.

3,947,175

APPARATUS FOR INJECTION MOLDING OF BODIES WITH A CORE AND SKIN OF DIFFERENT MATERIALS

Robert Albert Melcher, Wenden, Germany, assignor to Siemag Siegener Maschinenbau GmbH, Hilchenbach-Dahlbruch, Germany

Filed Dec. 7, 1973, Ser. No. 422,965
Claims priority, application Germany, Dec. 7, 1972, 2259818; Aug. 24, 1973, 2342789
Int. Cl.² B29F 1/10
U.S. Cl. 425—130 6 Claims



1. Injection molding apparatus for the injection molding of bodies consisting of several layers, including a foamed thermoplastic core and a non-foamed thermoplastic skin, by injecting foaming and non-foaming thermoplastic material into a hollow molding tool, comprising:

a. an injection head having an axial first bore,

b. a first injection cylinder adapted to deliver a foaming thermoplastic material,

c. a second injection cylinder adapted to deliver foaming thermoplastic material,

d. a ring jet closing sleeve axially movable within the first bore and having a second axial bore,

e. a closure needle axially movable within the second bore,

f. a ring jet formed by the injection head and the closing sleeve,

g. a central jet formed by the closing sleeve and the closure needle,

h. a first conduit adapted to carry material from one of the cylinders to the ring jet, and

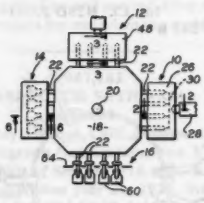
i. a second conduit adapted to carry material from the other of the cylinders to the central jet.

3,947,176

DOUBLE INJECTION MOLD WITH NECK GATING

Dewey Rainville, Westfield, N.J., assignor to Rainville Company, Inc., Middlesex, N.J.

Filed July 23, 1974, Ser. No. 491,063
Int. Cl.² B29D 1/04
U.S. Cl. 425—130 6 Claims



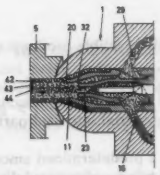
1. Molding apparatus including a first and a second injection mold, a core rod movable from one mold to the other, each injection mold having a cavity with means at one end for gripping the neck end of the core rod when the core rod is in the mold, each injection mold having a passage through which plastic is injected into the cavity, one of the molds having its injection passage at an end of the cavity at which the core rod is gripped and the other mold having its injection passage at the other end of its cavity, means for injecting material about said core rod in said first mold cavity and sequentially moving the core rod from said first mold cavity to the next, and for injecting a superimposed layer of molding material about said core rod is said second mold cavity to form a two-layer parison on the core rod.

3,947,177

APPARATUS FOR INJECTION MOLDING OF MULTI-LAYER BODIES OF THERMOPLASTIC

Helmut Eckardt, Hilchenbach-Dahlbruch, Germany, assignor to Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Germany

Filed Sept. 6, 1974, Ser. No. 503,653
Claims priority, application Germany, Sept. 13, 1973, 2346135
Int. Cl.² B29F 1/12
U.S. Cl. 425—130 2 Claims



1. Apparatus for the injection molding of multilayer bodies of thermoplastic, comprised of

a. a nozzle having a peripheral edge defining a central opening (7) adapted to be placed in communication with the sprue of a mold, the opening having an axis,

b. an outer sleeve (11) mounted within the edge for movement along the axis to form with the peripheral edge an outer ring nozzle (20), the sleeve shape conforming to the peripheral edge to allow sealing of the outer ring nozzle when the outer sleeve is in a closed position with respect to the edge and opening of the outer ring nozzle when the outer sleeve is in an open position with respect to the edge,

c. an inner sleeve (25) mounted within the outer sleeve for movement along the axis to form with the outer sleeve an inner ring nozzle, the inner sleeve shape-conforming to the outer sleeve to allow sealing of the inner ring nozzle when the inner sleeve is in a closed position with respect to the outer sleeve and opening of the inner ring nozzle when the inner sleeve is in an open position with respect to the outer sleeve,

d. a pin (34) mounted within the inner sleeve for movement along the axis to form with the inner sleeve a central nozzle, this pin shape-conforming to the inner sleeve to allow sealing of the central nozzle when the pin is in a closed position with respect to the inner sleeve and opening of the central nozzle when the pin is in an open position with respect to the inner sleeve,

e. a first source of fluid thermoplastic of a first type,

f. a second source, distinct from the first source, of fluid thermoplastic of a second type,

g. a first conduit which carries thermoplastic from the first source to the outer ring nozzle and central nozzle,

h. a second conduit which carries thermoplastic from the second source to the inner ring nozzle, the conduits being separate so that there is no intermixing of the thermoplastics of the first and second type prior to reaching the nozzles,

i. a drive actuator connected to the edge, sleeves, and pin and adapted to selectively cause the edge, sleeves, and pin to move with respect to one another.

3,947,178

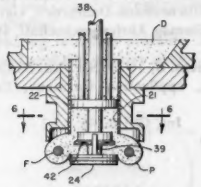
APPARATUS FOR MAKING FILLED FOOD PRODUCTS

Thomas E. Belshaw; Fred G. Woodworth, and Wilbur D. Wilke, all of Seattle, Wash., assignors to Belshaw Bros., Inc., Seattle, Wash.

Continuation-in-part of Ser. No. 463,155, April 22, 1974. This application Sept. 30, 1974, Ser. No. 510,561

Int. Cl.² A21C *11/18, 9/06*

U.S. Cl. 425—132 22 Claims



1. Apparatus for filling edible products with spots of filling material, comprising:

means for partially forming the product into its final form,

discrete separated tubes having discharge openings for injecting filling material into said partially formed product,

means for pushing a predetermined amount of filling material through said tubes and out said discharge openings to inject discrete spots of filling material within said partially formed product,

means for halting the flow of filling material, and

means for finally forming the product between the tube discharge openings and the injected filling material to form a final product completely enclosing at least one spot of filling material, said means for partially forming the product including a product material hopper having a forming cylinder, forming piston means reciprocably mounted in said forming cylinder, metering piston means axially spaced from said forming piston means and independently reciprocably mounted in said forming cylinder, means for reciprocating the forming and metering piston means in said forming cylinder to trap a quantity of product material and extrude it radially outwardly of said forming cylinder, said tubes extending lengthwise radially of said metering piston means for discharging discrete spots in the radially extruded product material.

6. Apparatus for filling edible products with discrete spots of filling material, comprising:

means for partially forming the product into its final form,

a plurality of discrete, separated tubes, each having a discharge opening for injecting filling material into said partially formed product,

means for applying positive pressure on said filling material in said tubes and for applying negative pressure on said filling material to partially retract the flow of filling material, and

means for finally forming the product between said discharge openings and the injected filling material to form a final product completely enclosing the spots of filling material, said means for partially forming the product including a product material hopper having a forming cylinder, forming piston means reciprocably mounted in said forming cylinder, metering piston means axially spaced from said forming piston means and independently reciprocably mounted in said forming cylinder, means for reciprocating the forming and metering piston means in said forming cylinder to trap a quantity of product material and extrude it radially outwardly of said forming cylinder, said tubes extending lengthwise radially of said forming cylinder between said forming piston means and said metering piston means for discharging discrete spots of filling material in the radially extruding product material.

3,947,179

DOUGH ROLLING MACHINE

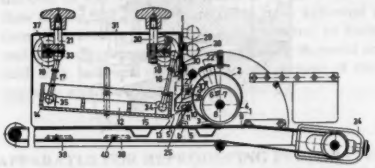
Kate Kemper, Wybuelstr. 6, CH-8702 Zurich-Zollikon, Switzerland

Filed Sept. 17, 1973, Ser. No. 397,949

Claims priority, application Germany, Sept. 16, 1972, 2245616

Int. Cl.² A21C *3/06*

U.S. Cl. 425—223 9 Claims



1. In a dough preparing apparatus having an endless belt for transporting dough pieces seriatim to a first dough rolling element, thereafter to means for elevating the front edge of the dough pieces, and finally to a second dough rolling member, the combination comprising, said endless belt having an upper flight arranged to traverse a horizontal inflexible surface, said first rolling element being supported on a horizontally disposed shaft and associated with a dough stripping member, said dough stripping member including a flexible tubular member that is provided with a longitudinally extending slitted wall having opposed abutting edge portions, each of which has been moved laterally to permit a biased engagement with the periphery of said first rolling element, said dough elevating means associated with a shaft means lying in a plane parallel with the shaft of said first rolling element and serving to lift the front edge of each dough piece and bend it backwardly upon the dough piece while it is still rolling contact with the first rolling element.

3,947,180

APPARATUS FOR COMBINED INJECTION MOULDING AND BLOW FORMING OF CONTAINERS OR OBJECTS FORM PLASTICS MATERIAL

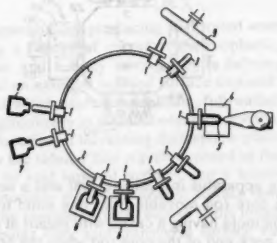
Robert Neumaier, Glottertal am Ohrensbachle, Germany, assignor to Van Leer Verpackungen GmbH, Germany

Filed Aug. 15, 1973, Ser. No. 388,453

Claims priority, application Germany, Aug. 17, 1972, 2240374

Int. Cl.² B29D *23/03*

U.S. Cl. 425—242 B 4 Claims



1. An apparatus for the combined injection moulding and blow moulding of objects from plastic material comprising: a plurality of mandrels; conveyance means, said mandrels being

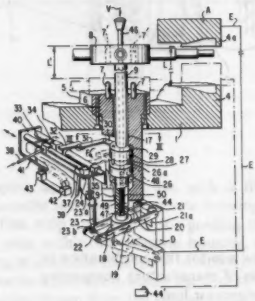
mounted on said conveyance means, each of said mandrels being moveable on said conveyance means independently of the other mandrels; at least one injection moulding means for moulding a plastic preform on said mandrel, and at least one more blow moulding means for blow moulding said preform than injection molding means, said conveyance means extending from said injection moulding means to said blow moulding means.

3,947,181

TOOL ASSEMBLY

Henry Desjonqueres, Paris, France, assignor to Carnaud Total Interplastic, Chalon-sur-Saone, France

Filed Sept. 25, 1973, Ser. No. 400,540
Int. Cl.² B29D *23/03*
U.S. Cl. 425—242 B **8 Claims**



1. A tool assembly comprising a table, a plurality of first mold portions disposed on the table, a mold carrier having thereon a plurality of second mold portions movable toward and away from the table to close and to open the molds, a tool carrying turret, a shaft supporting the turrent and journaled in the table for rotation and axial motion with respect thereto, means coupling the shaft to the mold carrier for translation upon translation of the mold carrier, a first drive means journaled in the table and mounted about the shaft to permit free rotation and axial motion of the shaft with respect to said first drive means, a reciprocating member and crank means coupling said reciprocating member to said first drive means to impose reciprocating angular motion on the first drive means, a second drive means engaged about the shaft and coupled thereto for rotation therewith, and releasable torque transmitting means coupling the first and second drive means together when the molds are open but not when the molds are closed.

3,947,182

FIBER OPTIC CONNECTOR WITH AXIAL TOLERANCE RELIEF

Ronald L. McCartney, Orange, Calif., assignor to International Telephone & Telegraph Corporation, New York, N.Y.

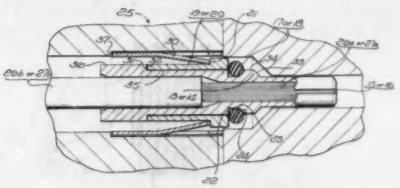
Continuation-in-part of Ser. No. 518,488, Oct. 29, 1974, abandoned. This application July 21, 1975, Ser. No. 597,943
Int. Cl.² G02B *5/16*
U.S. Cl. 350—96 C **18 Claims**

1. A termination pin assembly for adapting a fiber optic cable for insertion into a connector assembly, comprising:

a hollow elongated pin body having an axial bore of such a diameter over a predetermined axial dimension from a first end of said pin body so as to accommodate insertion of the optical fiber of said cable through said bore for at least said predetermined axial dimension, said first end of said pin body being the terminal end thereof when said cable is inserted within said pin:

a circumferential groove about a central portion of said pin body, said groove having first and second side walls, said first side wall being nearest said first end of said pin body;

an axially slidable sleeve mounted to slide over at least a portion of the outside surface of said pin body extending from said groove away from said first end of said pin body; and



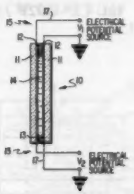
resilient annular ring means installed within said groove, said ring means being compressively engaged between said slidable sleeve and said first side wall of said groove and providing a resilient force tending to resist axial movement of said pin body first end toward said slidable sleeve.

3,947,183

LIQUID CRYSTAL DISPLAY SYSTEM

Werner E. L. Haas, Webster; James E. Adams, Ontario, and Bela Richter, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sept. 25, 1974, Ser. No. 509,056
Int. Cl.² G02F *1/13*
U.S. Cl. 350—160 LC **11 Claims**



1. A method of imaging, comprising: providing a layer of liquid crystalline composition comprising a mixture of p-[N-(p-butoxy-benzylidene) amino] phenylacetate; p-anisalaminophenylacetate; p-anisalamino valerophenone; N-(p-ethoxy-benzylidene)-p-butylaniline and N-(p-butoxybenzylidene)-p-butylaniline; and N-(p-methoxybenzylidene)-p-butylaniline; and, an optically active material selected from the group consisting of cholesteryl chloride; cholesteryl erucate; 2-(2-ethoxy) ethyl carbonate; and cholesteryl geranyl carbonate;

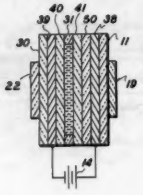
applying to one portion of the area of said layer an electrical potential across the thickness of said layer, said electrical potential having sufficient strength to place said mixture in its electrically induced dynamic scattering state; and

applying to another portion of the area of said layer an electrical field across the thickness of said layer, said electrical field having sufficient strength to transform said mixture to its electrical field induced aligned nematic state, thereby producing an image comprising said one and another portions of said layer.

3,947,184
IMAGING METHOD

Franklin D. Saeva, Webster, N.Y., and Patrick E. Sharpe, Ann Arbor, Mich., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 14, 1974, Ser. No. 523,597
Int. Cl.² G02F 1/28
U.S. Cl. 350—160 LC 25 Claims



1. An electro-optic method, for use with a liquid crystal cell containing between two electrodes a layer of positive dielectric anisotropic nematic liquid crystalline composition, comprising the steps of:

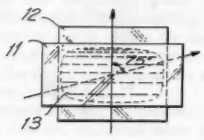
a. homeotropically aligning said composition by providing a coating of polysiloxane elastomer composition on each electrode and in contact with said layer of liquid crystalline composition; and

b. applying a voltage between said two electrodes.

3,947,185
FIELD EFFECT LIQUID CRYSTAL DISPLAY DEVICE

Shuji Maezawa, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Mar. 29, 1974, Ser. No. 456,335
Claims priority, application Japan, Mar. 30, 1973, 48-36398
Int. Cl.² G02F 1/13
U.S. Cl. 350—160 LC 4 Claims

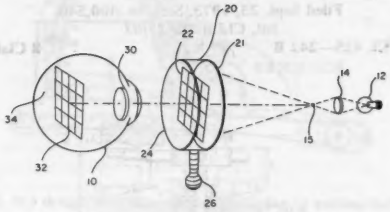


1. In a liquid crystal display device, a cell comprising opposed unidirectionally rubbed transparent plates, said plates being mounted so that said rubbing directions are at an angle to each other, the angle for said rubbing directions lying between 65° and 89° for type *a* liquid crystals, type *a* liquid crystals having the characteristic of an increase in potential energy with increase in angle between rubbing directions on opposed cell plates when placed therebetween, the angle for said rubbing directions lying between 91° and 115° for type *b* liquid crystals, type *b* liquid crystals having the characteristic of a decrease in potential energy with increase in angle between rubbing directions on opposed cell plates when placed therebetween, transparent conductors on the inner faces of said plates, and field effect nematic liquid crystal between said plates, said liquid crystal being a member selected from the group consisting of types *a* and *b*, said liquid crystal having a helical structure about an axis perpendicular to said plates, a substantial preponderance of the molecules in said liquid crystal lying in helices of the same twist direction.

3,947,186
EYE-TEST LENS AND METHOD

Bradford Howland, 77 Massachusetts Ave., Cambridge, Mass. 02139

Filed Mar. 17, 1975, Ser. No. 558,825
Int. Cl.² A61B 3/02; G02B 3/06
U.S. Cl. 351—17 10 Claims



1. As a new use for the combination of

I. an article of manufacture comprising

a. an astigmator lens,

b. a grid made up of two sets of substantially parallel occluding lines with the lines of each set spaced each from the next by a distance of from ¼ mm. to 2 millimeters, the lines of one of said sets intersecting the lines of the other set at an angle of between 65° and 115°, and

c. mounting means to hold said grid in a plane parallel to the axes of principal curvature of said astigmator, in close association with said astigmator and with the longer and the shorter diagonals of the cells of said grid parallel respectively to the sections through said astigmator for greatest positive and negative power,

II. together with means for holding said article as a test eyeglass in front of the eye of a human subject, and

III. A light source substantially a monochromatic point source, the method comprising the steps of

1. viewing by the subject said point source through said test eyeglass to see a blurred grid pattern,

2. optically adjusting the apparatus until the subject observes a predetermined normal pattern for the central cell of said blurred pattern,

3. representing by the subject the appearance of the whole visible blur pattern as a diagram, and

4. determining the amount and kind of aberration by comparison of said diagram with standard diagrams representative of known aberrations.

6. The new use as defined by claim one wherein if said angle is related to the strength of said astigmator and the distance at which said means for holding supports said article from said eye by the equation:

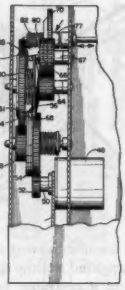
$$\phi = 2 \arctan \left(\frac{1 + dD}{1 - dD} \right)$$

where ϕ is said angle, d is the distance from said eye to said article in meters, and D is the power of each of two cylinder-lens elements, one positive, and one negative equivalent to said astigmator.

3,947,187
PHOTOGRAPHIC FILM DRIVE SYSTEM EMPLOYING INERTIA DUMPER

Joseph E. Murray, Jr., Malden, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed May 15, 1974, Ser. No. 470,179
Int. Cl.² G03B 1/40
U.S. Cl. 352—72 8 Claims



1. Photographic apparatus for use with a film handling cassette, the cassette including a cassette housing retaining a photographic film strip and means for guiding the film strip along a given path within the cassette housing, said guiding means including at least one film spool to which one end of the film strip is attached and upon which the film strip is wound, the film strip being drawn from the film spool as the film strip is advanced in a given direction within said cassette housing, the film strip being subject to abrupt stoppage within the cassette housing when the film strip is advanced to the one end, and the film strip and the film guiding means having a high spring rate, said apparatus comprising means for receiving the cassette, means for cooperating with the cassette when it is received in said receiving means for driving the film strip in at least said given direction along the given path within the cassette housing, said film driving means including means for absorbing at least a large portion of the kinetic energy of said driving means when film stoppage occurs, said absorbing means comprising means having a substantially lower spring rate than that of the film strip and the film guiding means when the film strip is driven by said driving means in said given direction, said driving means including a drive train having a plurality of elements configured for rotation, said absorbing means including a spring configured for intercoupling a first and a second of said plurality of elements, said spring having a lower spring rate than the spring rate of the film strip, said first and second elements engaging respective ends of said spring so as to provide a driving connection through said spring when said drive train is rotated in a first direction configured for advancing the film strip in said given direction, and said first and second elements include means for engaging each other so as to provide a direct driving connection when said drive train is rotated in the opposite direction.

3,947,188
VARIABLE CONJUGATE OPTICAL SYSTEM

George R. Simpson, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

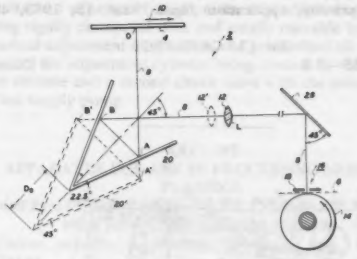
Filed Nov. 11, 1974, Ser. No. 522,665
Int. Cl.² G03B 21/28, 27/34
U.S. Cl. 353—76 8 Claims

1. A variable magnification optical system for projecting an image along an optical axis and including the following disposed along said optical axis:

a fixed object plane,

a fixed image plane,

a projection lens to project an image from said object plane to said image plane, and



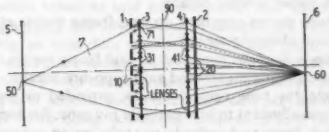
a double reflector to deflect said optical axis by 90°,

said double reflector being movable as a unit along a path which bisects said 90° deflection of said optical axis, whereby said optical axis is varied in length and held from lateral and angular displacement.

3,947,189
OPTICAL DATA PROJECTION DEVICE

Jean Pierre Huignard, Paris, France, assignor to Thomson-CSF, Paris, France

Filed July 23, 1974, Ser. No. 491,139
Claims priority, application France, July 27, 1973, 73.27572
Int. Cl.² G03B 21/14
U.S. Cl. 353—38 7 Claims



1. An optical data projection device comprising: an entry plane; a light source, capable of occupying a plurality of positions in said entry plane, said light source furnishing an incident beam of radiant energy; an object plane arranged in the path of said incident beam; a frame lying in said object plane for receiving a modulator object carrying said data; an exit plane arranged for receiving said radiant energy upon being transmitted across said frame; and stigmatic imaging means positioned between said entry plane and said exit plane for optically conjugating said entry plane and said exit plane; said stigmatic imaging means comprising two successive stigmatic optical systems separated from one another by a focussing intermediate plane, the first of said stigmatic optical systems optically conjugating said entry plane and said focussing intermediate plane; and the second of said stigmatic optical systems optically conjugating said focussing intermediate plane and said exit plane.

3,947,190
ELECTROPHOTOGRAPHIC APPARATUS FOR RECORDING IMAGES IN SUPERIMPOSED RELATIONSHIP

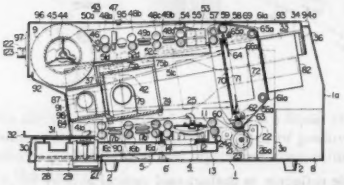
Osamu Otubo; Yujiro Tatsuno; Takatoshi Ikeda, and Toshio Tsubaki, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 13, 1974, Ser. No. 450,774

Claims priority, application Japan, Mar. 15, 1973, 48-30654

Int. Cl.² G03G *15/22*

U.S. Cl. 355—3 R **9 Claims**



1. A electrophotographic apparatus comprising

base means having a forward portion and a rearward portion, and including supporting column means provided on an upper surface of said base means at said rearward portion thereof;

frame means pivotally mounted on said supporting column means for movement to open and closed positions;

paper feeding means provided on said frame means opposite said forward portion of said base means;

charging means provided on said frame means at the rear of said paper feeding means;

exposure means provided on said frame means at the rear of said charging means;

a cathode ray tube provided on said frame means alongside said charging means and said exposure means;

cathode ray tube optical means, provided on said frame means adjacent to said cathode ray tube, for focussing an image from said cathode ray tube on an exposure plane of said exposure means;

format support means, provided at a forward portion of said frame means, for supporting a format;

format optical means, provided on said frame means adjacent to said format support means, for focussing an image from a format supported by said format support means on said exposure plane of said exposure means;

a tray provided at a forward portion of an upper surface of said base means;

fixing means provided on said base means at the rear of said tray;

developing means provided on said base means at the rear of said fixing means;

an electric motor provided on said base means alongside said developing means and said fixing means;

control means, provided on said base means adjacent to said motor, for controlling said motor; and

adjusting means for enabling the manual adjustment of the focus of an image from a format supported by said format support means on said exposure plane.

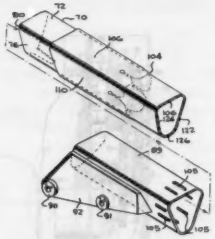
3,947,191
LIGHTWEIGHT HIGH STRENGTH BOOM CONSTRUCTION

Edwin Earl Milner, Jr., 103 Meadowrue Court, Williamsburg, Va. 23185

Filed June 25, 1974, Ser. No. 483,069

Int. Cl.² F16B *7/10*

U.S. Cl. 403—334 **20 Claims**



1. A hollow boom member having an inner end and an outer end formed of an elongated hollow shell member including an inner end comprising a coupling portion dimensioned and shaped to be attached to a boom support member and an outer boom portion extending outwardly from said coupling portion and comprising a top wall having progressively decreasing width from its inner end to its outer end, opposed side walls having downward convergence with the degree of downward convergence of said opposed side walls progressively decreasing from the inner end to the outer end of said outer boom portion and a curved bottom connector wall portion of downwardly convex configuration at all transverse section planes of the boom member extending between lower portions of said opposed side walls.

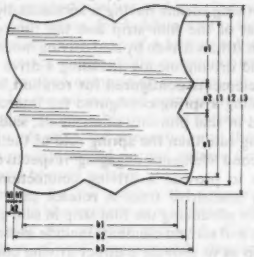
3,947,192
PAVING BLOCK

Hugo Rosenberger, Alzenauer Strasse 29a-33, 8756 Kahl (Main), Germany

Filed Nov. 15, 1974, Ser. No. 524,055

Int. Cl.² E01C *5/00*

U.S. Cl. 404—41 **11 Claims**

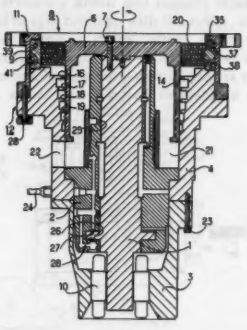


1. A paving block particularly for the laying of roadways, yards and the like, said block having symmetrical defining surfaces on all sides, said surfaces extending in the same direction on each side, and being disposed clockwise in a respective succession of a concave portion adjoining a rectilinear portion which in turn adjoins a convex portion with said rectilinear portion adjoining said concave portion and said convex portion at an angle of approximately 45°, and with the opposite ends of said concave portion and said convex portion being broken off at approximately one-half the apex height of said rectilinear portion.

3,947,193
MOLECULAR VACUUM PUMP STRUCTURE

Louis Maurice, Paris, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, France

Filed Mar. 28, 1974, Ser. No. 455,657
Claims priority, application France, Mar. 30, 1973, 73.11549
Int. Cl.² F04D 1/10
U.S. Cl. 415—143 9 Claims

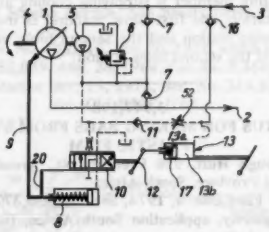


1. A molecular vacuum pump arrangement comprising:
turbo-molecular pumping means for providing evacuation of predetermined gases, said turbo-molecular pumping means including a predetermined number of stages,
rotating-drum pumping means directly connected to said turbo-molecular pumping means for providing further evacuation of said predetermined gases,
wherein said turbo-molecular pumping means includes an outlet corresponding to an inlet of said rotating-drum pumping means, and
shaft means for rotatably supporting rotating elements of both of said turbo-molecular pumping means and said rotating-drum pumping means.

3,947,194
APPARATUS FOR DAMPING THE PRESSURE INCREASE OF HYDROSTATIC DRIVES

Karl Schlecht, Bernhausen near Stuttgart, Germany, assignor to Putzmeister Interholding GmbH., Zurich, Switzerland

Division of Ser. No. 333,652, Feb. 20, 1973, Pat. No. 3,854,847. This application Aug. 2, 1974, Ser. No. 494,172
Claims priority, application Germany, Feb. 22, 1972, 2208172
Int. Cl.² F04B 49/00; F15B 15/18
U.S. Cl. 417—212 1 Claim

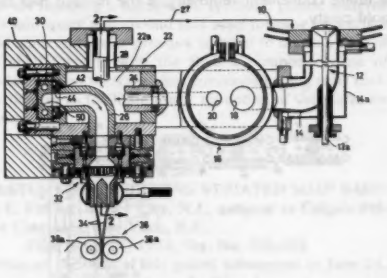


1. An apparatus for damping the pressure increase of hydrostatic drives, especially axial piston pumps with swash plate control and pre-biased oil circulation system, the improvement comprising an adjustment cylinder having a pressurized oil compartment, a pump, an oil infeed means including an oil infeed line for the pump, a first check valve, the pressurized oil compartment of the adjustment cylinder being flow connected with the low pressure side of the oil infeed line of the pump via said first check valve, said first check valve opening in the direction of the low pressure infeed line, a servo-adjustment means including an external adjustment lever hingedly connected with the adjustment cylinder, a supply pump, a mechanical adjustment mechanism, said adjustment cylinder being rigidly connected with and axially movable by the mechanical adjustment mechanism, the pressurized oil compartment of the adjustment cylinder being connected via a regulation throttle and a second check valve with the pressure side of the supply pump.

3,947,195
APPARATUS FOR USE IN PROCESSING MOLTEN PLASTICS

Rudolf Paul Fritsch, Goslarer Str. 58, 7 Stuttgart-31, Germany

Filed July 31, 1974, Ser. No. 493,276
Claims priority, application Germany, Aug. 2, 1973, 2339194
Int. Cl.² B29C 29/00
U.S. Cl. 425—190 4 Claims



1. Apparatus for producing plastics granulate from batches of freshly polymerized molten plastics including in combination a polymerization vessel in which a batch of plastics is polymerized, an extrusion die, a supply line connecting said polymerization vessel to said extrusion die, said supply line comprising a pump and downstream of said pump a three-way valve having an inlet duct connected with said pump and a first outlet duct and a second outlet duct, said first outlet duct being connected with said extrusion die and a recycling line connecting said second outlet duct with said polymerisation vessel, said valve being actuatable between a first position thereof in which said first outlet duct is connected to said inlet duct for the extrusion of plastic strands to be granulated and a second position of said valve in which said second outlet duct is connected with said inlet duct for flushing all of the supply line between the vessel and the valve and the pump and the valve itself and the recycling line after completion of the polymerization process and prior to starting of the extrusion process.

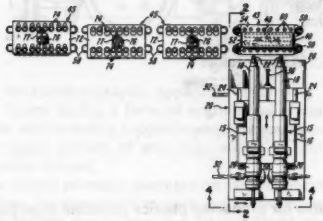
3,947,196
INJECTION MOLDING APPARATUS

Murray C. Tribbett, and George H. Laug, both of Piqua, Ohio, assignors to The French Oil Mill Machinery Company, Piqua, Ohio

Filed Mar. 28, 1974, Ser. No. 455,621
Int. Cl.² B29F 1/06
U.S. Cl. 425—248 23 Claims

1. In apparatus for injecting a material into a mold cavity defined between a set of upper and lower mold sections, and including a vertical press having a set of upper and lower mold support platens with substantially parallel surfaces for sup-

porting the corresponding mold sections therebetween, means for moving one of said platens relative to the other said platen for moving said mold sections between open and closed positions, and an injection molding machine positioned for injecting the material into the cavity when the mold sections are in their closed position, the improvement wherein said press comprises a plurality of parallel tie rods extending adjacent the mold sections substantially perpendicular to said surfaces of said platens, said tie rods being movable axially between extended and retracted positions relative to said platens, hydraulic actuated means connected to one of said platens for moving said tie rods axially, latch means for releasably connecting said tie rods to the other said platen when said tie rods are in said extended position, said hydraulic actuated means and said tie rods in said extended positions being effective to clamp said platens together with a substantial force distributed along the mold sections, said tie rods in said retracted positions providing for removing at least one of the mold sections through the paths of said tie rods, power operated means for moving the mold sections generally horizontally between a molding station between said platens and a part removal station when said platens are in said open positions and said tie rods are in said retracted positions, and means for automatically tilting the upper mold section upwardly and for tilting the lower mold section downwardly at the part removal station to facilitate convenient removing of the molded part from the mold cavity.



2. In apparatus for injecting a material into a mold cavity defined between a set of mold sections having a substantial length, and including a press having a set of mold support platens with substantially parallel surfaces for supporting the mold sections therebetween, means for moving one of said platens relative to the other said platen for moving said mold sections between open and closed positions, and an injection molding machine positioned for injecting the material into the cavity when the mold sections are in their closed position, the improvement wherein said press comprises a plurality of parallel tie rods extending adjacent the mold sections substantially perpendicular to said surfaces of said platens, the spacing between adjacent said tie rods being substantially less than the length of the mold sections, means on one of said platens for supporting said tie rods for axial movement between extended and retracted positions relative to said platens, hydraulic actuated means secured to said one platen and connected to said tie rods for rapidly moving said tie rods between said retracted and extended positions, latch means for releasably connecting said tie rods to the other said platen when said tie rods are in said extended position, said hydraulic actuated means and said tie rods in said extended positions being effective to clamp said platens together with a substantial force distributed along the length of the mold sections, and said tie rods in said retracted positions providing for removal at least one of the mold sections through the paths of said tie rods after each molding operation.

3,947,197

BLOW MOLDING APPARATUS

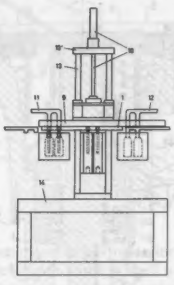
Johannes Mehnert, Ernststrasse 11, 5205 St. Augustin-Menden, Germany

Filed Aug. 19, 1974, Ser. No. 498,362

Claims priority, application Germany, Aug. 21, 1973, 2342134

Int. Cl.² B29D *23/03*

U.S. Cl. 425—324 B **6 Claims**



1. Apparatus for the manufacture of hollow bodies of thermoplastic material, comprising

a. a first blow station,

b. a second blow station spaced from the first blow station,

c. a preforming station spaced midway between the first and second blow station, so that the preforming station is a specific distance from each blowing station and the three stations define a path passing through each station,

d. a beam,

e. a motion mechanism adapted to move the beam parallel to, toward, and away from the path,

f. a first blow mandrel extending from the beam toward the path,

g. a second blow mandrel extending from the beam toward the path and spaced the specific distance from the first blow mandrel,

h. a first compressed-air feeding member movable to selectively supply cooling air to the first blow station,

i. a second compressed-air feeding member movable to selectively supply cooling air to the second blow station,

j. a control mechanism operable on the apparatus to bring about a work cycle, the work cycle having a first phase in which the first blow mandrel is inserted in the first blow station, the second blow mandrel is inserted in the preforming station and the second compressed-air feeding member is supplying cooling air to the second blow station, and a second phase in which the first compressed-air feeding member is supplying cooling air to the first blow station, the first blow mandrel is inserted in the preforming station and the second blow mandrel is inserted in the second blow station.

3,947,198

APPARATUS FOR MAKING BAGS FROM SYNTHETIC PLASTIC FILM

Thomas Gough Hutt, 936 Pretorius St., Arcadia, Pretoria, Transvaal Province, South Africa

Filed Dec. 6, 1974, Ser. No. 530,377

Claims priority, application South Africa, Dec. 12, 1973, 73/9438

Int. Cl.² B31B *21/14*

U.S. Cl. 425—327 **12 Claims**

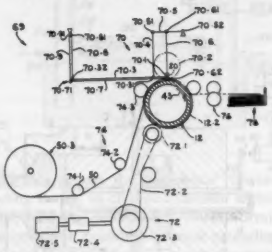
1. A bag-making machine, which includes:

a. a cylindrical roller having means to rotate said roller about its axis, the roller having a plurality of circumferentially spaced longitudinal slots in its periphery;

b. feed means adapted to feed a continuous web of heat-sealable synthetic plastics material to the roller at a rate corresponding to the rate of rotation of the roller;

c. a cutter sealing member mounted to be displaceable both radially relative to the roller axis and arcuately about the roller axis and having a cutter blade adapted in operation to register with and to enter into a slot of the roller, the cutter sealing member thereby cutting and sealing the film layers;

d. displacing means for cyclically displacing the cutter sealing member arcuately about and radially relative to the roller axis and in synchronism with the roller, the displacing means including a crank wheel meshing with a toothed wheel fast and co-axial with the roller and driven thereby, and a link lever system connected via a crank pin to the crank wheel and adapted to displace the cutter



sealing member to have a reciprocating movement to cause the cutter sealing member to perform working and return strokes while moving in a closed loopshaped path; and

e. mating formations fast with the roller and with the cutter sealing member respectively, and adapted to engage with each other at the start of a cycle of operation, and to move in unison with each other over an arc about the roller axis, and to disengage from each other at the end of the arc, the mating formations being adapted to ensure, upon inter-engagement with each other, that the cutter blade registers accurately with and remains in registration with a slot in the roller surface during the period of travel over the arc, during which period the mating formations are engaged and the cutter sealing member and roller are moving in unison over the arc, and during which period sealing and cutting of the film layers is taking place.

3,947,199

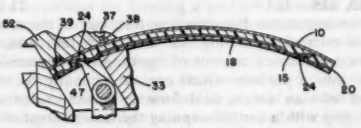
APPARATUS HAVING MOVEABLE POCKET FORMING MEMBERS FOR INJECTION MOLDING A COMPOSITE PLATE

Robert F. Hecht, 115 Bradstreet Road, Centerville, Ohio 45459, and Stanley Perdue, 345 Beatty Drive, Xenia, Ohio 45385

Division of Ser. No. 108,010, Jan. 20, 1971, which is a division of Ser. No. 755,059, Aug. 26, 1968, Pat. No. 3,566,789. This application Dec. 13, 1972, Ser. No. 314,828

Int. Cl.² B29F *1/10*

U.S. Cl. 425—127 **2 Claims**



1. Apparatus for manufacture of composite printing plates by molding a synthetic plastic backing onto the entire back surface of an electrotype shell and for simultaneous forming of scarf cavities in said backing comprising

a first molding die having a first mold cavity arranged to receive an electrotype shell therein and curved to the desired curvature of the composite plate,

retaining means and registering means associated with said first die and operative to locate and hold an electrotype shell in said first die with the rear surface of the shell exposed in said first mold cavity,

a second molding die operatively associated with said first die and having a second mold cavity also curved to the desired shape of the composite plate,

movable means supporting said dies and operative to move said dies together with said mold cavities in registry to define a space of predetermined thickness between the shell and said second die,

scarf forming means supported on the surface of said second cavity and extending partially into selected regions of said space and shaped to prevent flow of the plastic material into such regions so as to form a plurality of scarf cavities in the plastic as it hardens in said space and against said second mold cavity around the scarf forming means,

movable members supported on said second die and operative to hold said scarf forming means in position within said space when said dies are closed in registry, and

means for injecting a hardenable synthetic plastic material into said space and around said scarf forming means in a fluid state and under pressure to bond to the rear face of the shell forming with the shell a composite plate of predetermined thickness and curvature having scarf cavities therein to facilitate quick mounting of the plates on a press.

3,947,200

APPARATUS FOR PRODUCING STRIATED SOAP BARS

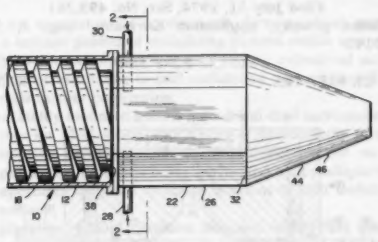
Charles F. Fischer, Jersey City, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Sept. 17, 1974, Ser. No. 506,686

The portion of the term of this patent subsequent to June 24, 1992, has been disclaimed.

Int. Cl.² B29F *3/12*

U.S. Cl. 425—131.1 **5 Claims**

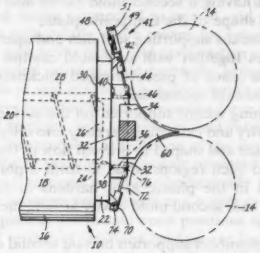


1. An apparatus for producing striated soap on a high intensity mixer extruder comprising a first barrel, having a first and a second end, first screw means in said first barrel, a second barrel having a first and a second end, said second ends being coextensive, second screw means in said second barrel, means for rotating said first and second screw means counter-currently, means for feeding soap into said first ends of said first and second barrels, dye injection means for injecting dye disposed at said second ends of said first and second barrels said dye injection means including a single chamber housing mounting dye injection tips, said dye injection tips terminating at a point adjacent and downstream to said second ends, and nozzle means communicating with said dye injecting means for discharging striated soap.

3,947,201
EXTRUDER AND ROLL DIE APPARATUS

Henry Ellwood, Rochdale, England, assignor to USM Corporation, Boston, Mass.

Filed Nov. 18, 1974, Ser. No. 524,792
Claims priority, application United Kingdom, Dec. 7, 1973, 56814/73
Int. Cl.² B29C 3/06
U.S. Cl. 425—147 8 Claims

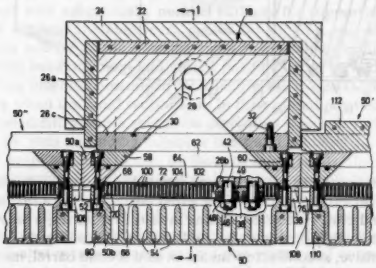


1. In apparatus for extruding and forming plastic material, an extruder for feeding plastic material, rolls adapted to receive and form the extruded material, a unit forming a connecting passage between the extruder and the rolls, said passage being formed at opposed sides of the extruder opening by stationary guides and at other opposed sides by plates extending between and swingably mounted on the guides for movement between open and closed positions, means for maintaining the plates in closed positions to direct extruded material into said rolls, the maintaining means being operable to move the plates to open positions to provide access to the rolls and the extruder.

3,947,202
APPARATUS FOR FILTERING MOLTEN PLASTICS AND FOR EXTRUDING PLASTIC STRANDS

Werner F. Göller, Am Heckerhof 57; Helge F. Luckenbach, Doerperhofstrasse 14, both of, 415 Krefeld, and Rudolf Paul Fritsch, Goslarer Str. 58, 7 Stuttgart-31, all of Germany

Filed July 31, 1974, Ser. No. 493,261
Claims priority, application Germany, Aug. 2, 1973, 2339193
Int. Cl.² B29F 3/00
U.S. Cl. 425—185 8 Claims

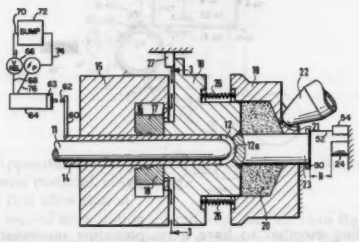


1. Apparatus for filtering molten plastics and for extruding plastic strands including in combination, a casing formed with a slide surface, a plastics supply duct in said casing leading into said casing slide surface, an interchangeable unit comprising a filter and a die head from which plastic strands are discharged, said unit being formed with a slide surface having an inlet port therein, and means for mounting said unit on said casing with said slide surfaces in engagement for movement of said unit transverse to the direction of flow of plastics material, said mounting means comprising guide rails for receiving said unit and means for resiliently biasing said guide rails toward said casing resiliently to bias said slide surfaces into engagement.

3,947,203
APPARATUS FOR MANUFACTURING PLASTICS BLANKS

Peter Rose, Henstedt-Ulzburg, Germany, assignor to Heidenreich & Harbeck, Zweigneiderlassung der Gildemeister AG, Hamburg, Germany

Filed Oct. 18, 1974, Ser. No. 515,831
Claims priority, application Germany, Dec. 21, 1973, 2364004
Int. Cl.² B29F 1/05, 1/06
U.S. Cl. 425—245 R 7 Claims



1. An injection molding apparatus for forming plastic blanks, comprising a generally tubular mold cavity defined by an outer mold and a concentric mold mandrel, a retractable tubular sleeve telescoped over the mandrel to substantially occupy the mold cavity prior to the injection of plastic material, said sleeve being displaceable from the cavity at a rate dependent upon the rate of injection of plastic material into the cavity, means biasing said retractable sleeve toward a position to substantially occupy the mold cavity so that sleeve displacement is in response to plastic material completely filling the mold cavity, a fixed cylinder for receiving and accumulating moldable plastic material, said outer mold including an injection port providing communication between the mold cavity and the fixed cylinder, the outer mold being moveable into the cylinder to force material from the cylinder through the injection portion into the mold cavity, and a retractable shaft extending through the fixed cylinder for controlling communication between the cylinder and the mold cavity.

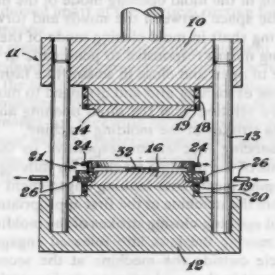
3,947,204
SCRAPLESS FORMING OF PLASTIC ARTICLES

Ralph E. Ayres; Kenneth J. Cleereman, both of Midland, and Walter J. Schrenk, Bay City, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 295,092, Oct. 2, 1972, abandoned, which is a division of Ser. No. 62,969, Aug. 11, 1970, Pat. No. 3,739,052. This application Jan. 14, 1974, Ser. No. 433,320
Int. Cl.² B29C 3/00, 17/00
U.S. Cl. 425—383 21 Claims

1. An apparatus for scrapless forming of thermoplastic articles comprising a ring-like forming fixture adapted to receive a measured amount of thermoplastic material to be forged into a preform which can subsequently be thermoformed into an article, said forming fixture comprising an upper ring with a central oepning the lower extent of which defines a peripheral dimension about the same as that of said preform less its rim area, a lower ring including a central opening the upper extent of which defines a peripheral dimen-

sion about the same as that of said preform less its rim area, a lip opening contoured out of at least one of said rings around the entire extent thereof and presenting a face angled from the horizontal sufficient to resist the retraction stress of the thermoplastic material of the preform, the inner surfaces of said rings adjacent their respective central openings being spaced from one another a distance no greater than the thickness of said preform and presenting opposed shoulders which together with said face secure the peripheral rim area of said preform, including its lip, in clamped fashion within said fixture priior to and during subsequent thermoforming of the preform into a container, cooling channels extending through at least one of said rings adjacent the rim receiving portion thereof sufficient to cool rapidly the rim area while leaving the central portion of said proform at a thermoformable temperature.



3,947,205

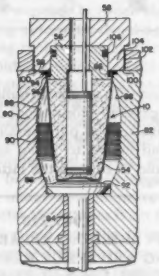
APPARATUS FOR FORMING NON-NESTABLE CONTAINERS

Bryant Edwards, Clarendon Hills, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Continuation of Ser. No. 328,197, Jan. 31, 1973, abandoned, which is a continuation of Ser. No. 12,652, Feb. 19, 1970, abandoned. This application Oct. 9, 1974, Ser. No. 513,427

Int. Cl.² B29D *23/03*

U.S. Cl. 425—387 B **5 Claims**



1. An apparatus for forming a nestable container made of plastic material and having a rim portion of predetermined diameter at the open end thereof into a non-nestable container product comprising a mandrel of a shape generally complementary to the shape of said nestable container so that said nestable container is mountable on said mandrel in close conforming relationship thereto, said mandrel comprising a lower heated portion and an upper insulated portion, said insulated portion having an axial extent substantially limited to said internal rim portion of said nestable container, said mandrel further including elastomeric air sealing means on said insulated portion for resiliently air sealing said internal rim portion of said nestable container on said mandrel and vacuum means for holding the portion of said nestable container below said rim portion in close conforming relationship to said lower heated portion of said mandrel so that the portion of said nestable container below said rim portion is heatable on said mandrel to a predetermined temperature where said portion of said nestable container below said rim is readily deformable, a mold cavity having a non-nestable inner wall configuration and a temperature substantially below said predetermined temperature, said mold cavity being formed to have an open upper end capable of receiving and cooperating with said mandrel, the unheated rim portion of said nestable container and said sealing means to seal said rim portion from said mold cavity below said open upper end after said portion of said nestable container below said rim portion is heated to said predetermined temperature and said mandrel is received within said mold cavity, and means in said mandrel for thereafter expanding by differential fluid pressure the portion of said nestable container below said rim portion against the non-nestable inner wall configuration of said mold cavity to form a non-nestable container product with a rim portion of predetermined diameter at its open upper end.

3,947,206

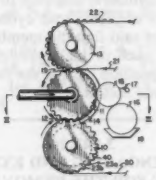
CORRUGATING APPARATUS

John DeLigt, Covington, and David F. Talbert, Millboro, both of Va., assignors to Westvaco Corporation, New York, N.Y.

Filed Oct. 10, 1974, Ser. No. 513,748

Int. Cl.² B29D *7/14*

U.S. Cl. 425—388 **12 Claims**



1. An apparatus for continuously forming sheet material into a surface profile of undulating pattern within a meshing nip between two cylindrical rolls having cylindrical surface profiles corresponding to said undulating pattern, one of said two rolls further comprising:

a rotatably mounted hollow cylindrical shell surrounding an interior void space and having a substantially circular interior periphery and an undulating exterior surface periphery, said shell being perforated by a multiplicity of apertures disposed in valley portions of said undulating surface;

a plurality of fluid conduits disposed within said interior space, secured non-rotatively relative to said shell longitudinally parallel with the cylindrical axis of said roll and adjacent said interior periphery, one end of said conduits being sealed closed and the other end being sealed to but open through a smooth face sliding seal ring;

said shell perforation apertures being in fluid communication with said conduits;

stationary vacuum chamber means having a fluid sealing surface cooperative with said sliding seal ring, said fluid sealing surface extending over and serving an arcuate portion of said seal ring; and,

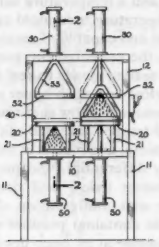
vacuum source means connected to said chamber means to evacuate atmospheric fluid from said conduits over an arcuate portion of said shell exterior surface coextensive with the arcuate portion of said seal ring served by said stationary vacuum chamber sealing surface during rotation of said one roll.

3,947,207

APPARATUS FOR PREFORMING BRASSIERE PADS

Herbert Magidson; Otto L. Huber, both of Beverly Hills, and Helmuth Hennrich, Manhattan Beach, all of Calif., assignors to Moldex/Metric, Inc., Culver City, Calif.

Filed May 28, 1974, Ser. No. 473,735
Int. Cl.² B29C *3/00*
U.S. Cl. 425—398 **8 Claims**



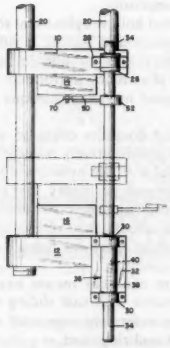
1. An apparatus for preforming brassiere pad blanks which comprises:
   a. a first die member comprising:
      i. a support member;
      ii. a plurality of rings axially spaced on said support member;
      iii. elastic means disposed between said rings and said support member; and
   b. a second die member comprising:
      i. a plurality of cylinders disposed to engage said rings;
      ii. elastic means engaging said cylinders whereby upon engagement of said first die member with said second die member, each of said cylinders will be displaced from its rest position against the force of said cylinder engaging elastic means.

3,947,208

ARTICLE ENGAGING AND EXTRACTING ARRANGEMENT FOR THE REMOVAL OF MOLDED PIECES FROM A MOLDING MACHINE

Walter M. Broderick, 854 Wilbraham Road, Springfield, Mass. 01109

Filed Mar. 19, 1975, Ser. No. 559,722
Int. Cl.² B29C *7/00*
U.S. Cl. 425—436 R **2 Claims**



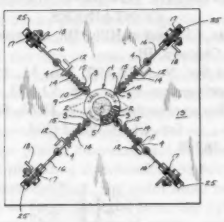
1. An article engaging and extracting arrangement for the removal of molded pieces from a molding machine and the deposit thereof at a point apart from the molding machine, the combination of:
   a rotatable and reciprocable driving shaft mounted on the molding machine for retrograde movement with the movable mold in a mold opening direction and for forward movement with the movable mold in a mold closing direction, a cam means fixed on the molding machine for generating a horizontal and rotational movement of the driving shaft responsively to mold opening and mold closing strokes, an extracting arm mounted on and movable with the driving shaft so as to be movable rearwardly with the driving shaft and into the space between the molds in the mold opening mode of the machine and out of the space between the molds and forwardly with the driving shaft in mold closing mode of the machine,
   gripping means responsive to penumatic or hydraulic pressure to open and close in scissor like fashion and carried by the extracting arm and arranged to move therewith in timed relation with the mold opening and mold closing cycle strokes of the molding machine,
   a sequencing mechanism responsive to the cyclic movements of the molding machine for moving the jaws of the gripping means into locking engagement with the article within the machine at the first appropriate moment in the mold opening-closing strokes of the molding machine and for moving the jaws into released engagement with the article outside the machine at the second appropriate moment in the mold opening-closing strokes of the molding machine.

3,947,209

MECHANICAL EXPANDER FOR ELASTIC MOLDS

Terrence S. Fox, Oshkosh, Wis., assignor to Lenox Candles, Inc., Oshkosh, Wis.

Filed Apr. 7, 1975, Ser. No. 565,355
Int. Cl.² B29C *4/00*
U.S. Cl. 425—440 **6 Claims**



1. In combination with an elastic mold, a mechanical expander comprising a generally continuous elastic mold, a plurality of expander means spaced peripherally of the mold and secured thereto, and means to move said first named means radially of the mold to expand the latter.

3,947,210

INJECTION MOLDING APPARATUS HAVING DEGATING AND SPRUE REMOVAL MEANS

Solomon Levites, 601 Longboat Club Road, Sarasota, Fla. 33577

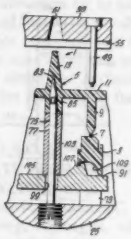
Filed June 18, 1973, Ser. No. 370,628
Int. Cl.² B29F *1/00*
U.S. Cl. 425—441 **6 Claims**

1. In an injection molding apparatus including two juxtapositionable side molds including cooperating means for forming a sprue and gates communicating with open-ended article-forming cavities;
   juxtapositionable bottom and top mold elements, at least one of said top and bottom mold elements being displaceable vertically relative to the other and including means for closing the open-ended article-forming cavities;

means operatively connecting said side molds and bottom and top mold elements for moving them simultaneously and in unison and causing the side molds to be spaced laterally at a vertical parting line therebetween when the top mold element is raised vertically from said bottom mold element, the improvement comprising:

automatic article degating means and sprue-removingmeans including bottom pins on said bottom mold element projecting into the article-forming cavities at the parting line for conforming to a surface of the articles being molded and supporting the molded articles thereon when the side molds are moved apart at the vertical parting line; soruе-removing means

sprue-pulling means of said bottom mold element comprising a sprue-holding rod projecting from the bottom mold element at the vertical parting line and including an upper portion projecting into the sprue, said sprue-holding rod including means for receiving on the portion projecting into the sprue molding material therein so that the sprue of the articles and the molded articles are integrally connected by the gate;



top pins and top members depending from said top molded element at the vertical parting line into said article-forming cavities for movement with the top mold element relative to the bottom mold element and side molds upon upward relative movement of said top mold element; and

stripper means on said bottom mold element and including means for moving the stripper means relative to the bottom pins and sprue-holding rod when the side molds are apart at the vertical parting line when the sprue and the molded articles are exposed between the side molds; said top pins comprising automatic degating means including means for receiving mold material therein for automatic degating of the molded articles from the sprue prior to the sprue being separated from the sprue-holding rod, said sprue-holding rod being displaceably mounted in said bottom mold element and having limited relative movement with respect to said bottom mold element, said top pins and sprue-holding rod having means affording a timing sequence between article-degating and sprue-removal whereby initial upward movement of said top mold element degates the articles from the sprue retained on the sprue-holding rod, and the stripper means subsequently strips the sprue from the sprue-holding rod after the side molds are spaced at the vertical parting line.

3,947,211

SUPPORT MEANS FOR AN ELONGATED POURING PIPE

Yasushi Ishihara, No. 16-I, I-Chome, Takeoka, Kiyose, Tokyo, Japan

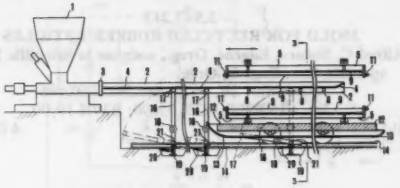
Filed Aug. 20, 1973, Ser. No. 389,803
Int. Cl.² B28B *13/02*
U.S. Cl. 425—447 **6 Claims**

1. An apparatus for forming a concrete structural member comprising:

an elongated molding frame;

an elongated pouring pipe adapted for pouring a concrete mixture therethrough, said pouring pipe longitudinally positionable within said molding frame;

a plurality of support pins extending through said elongated molding frame and removable therefrom, said support pins in slideable contact with said pouring pipe when said pouring pipe is disposed within said elongated molding frame; and



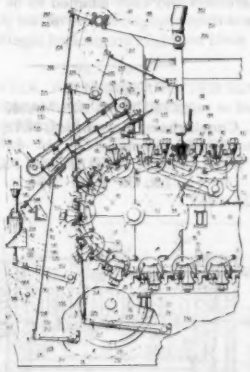
a plurality of support levers to provide support for said pouring pipe when said pouring pipe is withdrawn from contact with said support pins within said elongated molding frame, said support levers being normally biassed into supporting engagement with said pipe and also being retractable from engagement with said pipe upon engagement by means associated with said molding frame.

3,947,212

APPARATUS FOR MAKING PASTRY CUPS AND THE LIKE

Arthur J. Griner, Wyckoff, and Daniel Anthony Koppa, Bloomfield, both of N.J., assignors to Nabisco, Inc., East Hanover, N.J.

Division of Ser. No. 103,707, Jan. 4, 1971. This application Nov. 18, 1974, Ser. No. 524,701
Int. Cl.² A21B *1/46*
U.S. Cl. 425—451.9 **16 Claims**



1. Apparatus comprising a conveyor carrying a plurality of longitudinally spaced molds on transversely-disposed mold bars and interfitted cores mounted on transversely-disposed core bars from which the cores extend, said core bars overlying the mold bars when the cores are interfitted with the molds, said cores and core bars being removable from the molds and said cores having limited reciprocation relative to the core bars in a direction into and out of the molds, interengaging stop means on the cores and molds to determine the fully inserted position of the cores, resilient means acting

between the core bars and the cores for constantly thrusting the cores into the molds, a first core manipulating means for removing the cores from the molds and temporarily storing the removed cores on the conveyor, a second core manipulating means downstream of said first means for removing the cores from storage on the conveyor and re-inserting them in the molds, and releasable means for selectively latching each core bar to an underlying mold bar.

3,947,213

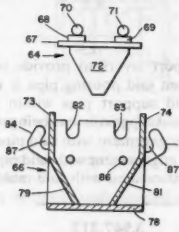
MOLD FOR RECYCLED RUBBER ARTICLES

Alfred C. Sodaro, Eugene, Oreg., assignor to Scientific Developments, Inc., Eugene, Oreg.

Filed Mar. 20, 1975, Ser. No. 560,496

Int. Cl.² B30B *9/28, 15/00;* **B29H** *19/00*

U.S. Cl. 425—451.9 **4 Claims**



1. A molding device for use in a press comprising a first mold member having a mold cavity therein, a second mold member releasably mating with said first mold member and having a portion extending into said mold cavity, securance means for releasably joining said first and second mold members together to maintain high pressure in the mold charge said securance means including a plurality of latches pivotally secured to the exterior of said first mold member and a plurality of slots in said first mold member adjacent said latches, said second mold member including a plurality of members exterding therefrom and each adapted to be seated in one of said slots and to be engaged by one of said plurality of latches when said mold members are pressed together.

3,947,214

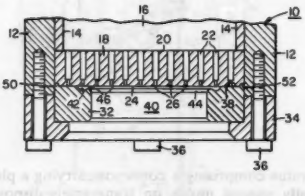
EXTRUSION DIE MASK

George M. Cunningham, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Dec. 13, 1974, Ser. No. 532,362

Int. Cl.² B29F *3/04*

U.S. Cl. 425—467 **6 Claims**



1. An extrusion die mask for use in combination with die means having a plurality of feed passageways which communicate with selected areas of a plurality of interconnected discharge slots for forming honeycomb structures which comprises, a mask having a blocking surface for blocking off selected portions of the outlet face of an extrusion die for forming honeycomb structures, an orifice extending longitudinally through said mask and communicating at an inlet end with said blocking surface for receiving an extruded honeycomb article therethrough, annular recess means formed in said blocking surface radially outwardly of said orifice and communicating with the outlet face of said extrusion die for receiving and compacting extruded batch material from said die and for forming a reservoir of said extruded material, and predetermined metering gap means formed in said blocking surface and communicating between said recess means and said orifice for metering the flow of said batch material from the reservoir to said orifice and for forming a smooth skin of desired thickness on the honeycomb article extruded from said die.

3,947,215

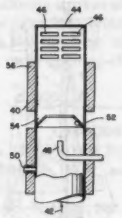
FUME FLARE

Richard W. Peterson; L. Graydon Carpenter, and Raymond Kastelic, all of Lower Burrell, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Jan. 7, 1975, Ser. No. 539,242

Int. Cl.² F23G *7/06*

U.S. Cl. 431—5 **7 Claims**



1. A method of burning fume, including combustible gases and gas-borne combustible particles, comprising moving the fume in a tube through at least one slit in the tube, while preventing the fume from going further in the tube and while the fume is at least partially at ignition temperature, heating the fume in the tube by a burner, adding air between any slits and the burner, and moving the fume out into the air, the slit width and total area being chosen such that the fume velocity through any slits is between flame velocity and the flame blow-out velocity and such that the fume will burn before being quenched by the air to below ignition temperature.

3,947,216

BURNER FOR LIQUID FUELS

Constantin Gh. Teodorescu; Ilie C. Chiriac; Constantin I. Adam; Marin R. Diaconescu; Nicolae T. Dragan, and Wilhelm F. Ber, all of Bucharest, Romania, assignors to Institutul Pentru Creatie Stiintifica Si Tehnica, Bucharest, Romania

Filed Aug. 5, 1974, Ser. No. 495,031

Claims priority, application Romania, Nov. 7, 1973, 76566

Int. Cl.² F23D *15/02*

U.S. Cl. 431—352 **3 Claims**

1. A liquid-fuel burner comprising:

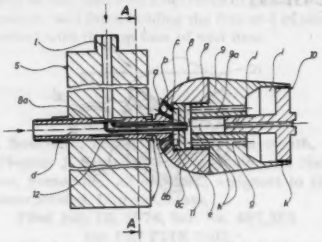
an outer generally cylindrical housing having an outwardly flared intake end and an outlet end remote from said intake end;

a perforated generally cylindrical flame stabilizer disposed in said housing and coaxial therewith while being spaced with substantially all-around clearance from the inner wall of said housing at said intake end thereof;

a profiled rib extending radially of said flame stabilizer in said housing;

an outer Coanda ejector mounted on said rib coaxial with said flame stabilizer and therein proximal to said intake end, said Coanda ejector comprising a body defining with said rib an annular outwardly opening slot, said body

having a bulbous convex portion axially spaced from said slot toward said outlet end and rotationally symmetrical about the common axis of Coanda ejector and said flame stabilizer, said body thereafter converging toward said outlet end;



means for supplying combustion air to said slot; and

means for feeding a liquid fuel to said body, said body being formed with a chamber receiving said fuel and with passages extending from said chamber toward said intake end and terminating along the surface of said bulbous portion of said body for discharging fuel therealong.

3,947,217

PROCESS AND APPARATUS FOR THE PRODUCTION OF INERT GAS

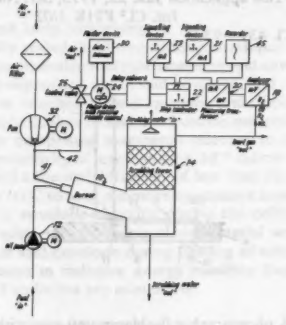
Johannes W. Graat, Overasselt; Johannes C. H. Pelser, Weurt, and Bart C. Hoornenborg, Nijmegan, all of Netherlands, assignors to Smit Nijmegan B.V., Nijmegen, Netherlands

Filed July 23, 1973, Ser. No. 381,894

Claims priority, application Germany, Sept. 22, 1972, 2246742

Int. Cl.² F23N *1/02*, *3/08*

U.S. Cl. 431—12 **14 Claims**



1. A process for the production of inert gas comprising supplying an air mixture to a combustion chamber, supplying a hydrocarbon fuel mixture to said combustion chamber, combusting said hydrocarbon fuel mixture with said air mixture to form certain gaseous products, cooling said gaseous products, measuring the quantity of a characteristic component of the inert gas in said gaseous products, and controlling said air mixture discontinuously at timed intervals with intervals therebetween of non-control in response to variations of the quantity of said characteristic component of inert gas exceeding predetermined limits by operating a regulator regulating a portion of the maximum quantity of air mixture fed to said combustion chamber.

3,947,218

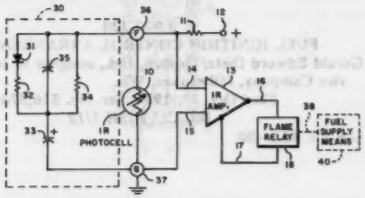
SAFETY CIRCUIT FOR MONITORING A FLICKERING FLAME

William R. Landis, Richfield, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 23, 1975, Ser. No. 543,565

Int. Cl.² F23N *5/08*

U.S. Cl. 431—79 **7 Claims**



1. In a fuel burner control system which utilizes flame flicker responsive sensor means to monitor the burning of fuel to thereby control fuel supply means, including; flame flicker responsive sensor means which varies in impedance with exposure to the radiation from a flame wherein said variations in impedance are rapid enough to follow the flicker radiation of said flame; flame flicker responsive amplifier means having input terminals including a voltage source and output terminals with said amplifier means responding to a range of flicker frequency normally found in the variations of radiation from said flame; said flame flicker responsive sensor means connected to said input terminals and fuel flow control means connected to said output terminals; safety network means connected in parallel with said sensor means; and said safety network means including a diode, impedance means, and a first capacitor connected in series circuit and further including a second capacitor and a resistor connected in parallel circuit with each other and in parallel with said diode and said impedance means; said safety network means altering the effect of said sensor means briefly upon the termination of flame to prevent said sensor means from inadvertently sensing a hot refractory surface in said fuel burner by said second capacitor charging from said voltage source at said input terminals.

3,947,219

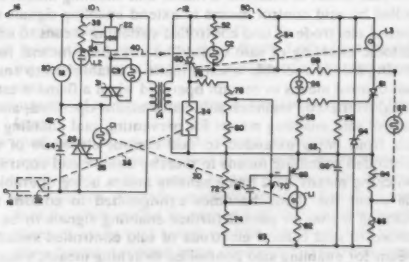
BURNER CONTROL WITH INTERRUPTED IGNITION

Eugenio Espiritu Santo, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Feb. 24, 1975, Ser. No. 552,516

Int. Cl.² F23N *5/08*

U.S. Cl. 431—79 **9 Claims**



1. A burner control system having a burner motor, an igniter, a flame detecting means, and a thermostat, with an interrupted ignition capability comprising:

a primary circuit including a first triac for connecting the burner motor and igniter to a line voltage and a second triac for disconnecting the igniter from the line voltage;

a secondary circuit responsive to the thermostat and the flame detecting means; and

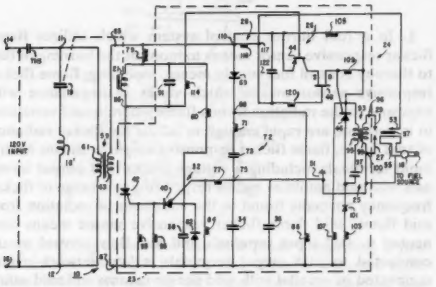
an optical coupler having its light generating source operatively connected to said secondary circuit and its light sensitive resistance connected to the gate of said second triac, effective to interrupt ignition in the presence of a burner flame.

3,947,220

FUEL IGNITION CONTROL ARRANGEMENT

Gerald Edward Dietz, Goshen, Ind., assignor to Johnson Service Company, Milwaukee, Wis.

Filed Oct. 21, 1974, Ser. No. 516,374
Int. Cl.² F23H 5/12
U.S. Cl. 431—80 **20 Claims**



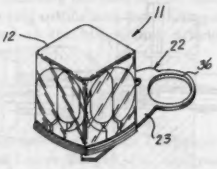
1. In an automatic fuel ignition system having valve means operable when energized to supply gaseous fuel under pressure to a burner apparatus, a control arrangement for controlling the operation of said valve means and for effecting ignition of fuel supplied to said burner apparatus, said control arrangement comprising control means operable to energize said valve means for a first duration, ignition means including spark producing means including electrode means positioned adjacent said burner apparatus, discharge means coupled to said electrode means, means for enabling said discharge means to be charged to a predetermined potential, and controlled switching means operable when enabled to cause said discharge means to discharge to thereby apply a high voltage pulse to said electrode means for generating an ignition spark in the proximity of said burner apparatus for igniting fuel from said fuel outlet to establish a flame, and enabling means controlled by said control means to extend enabling signals to a control electrode of said controlled switching means to effect periodic enabling of said controlled switching means, flame sensing means operable when a flame is established to enable said control means to remain operated when a flame is established to thereby maintain said valve means operated, and to control said enabling means for preventing said enabling signals from being extended to said control electrode of said controlled switching means to thereby disable said controlled switching means, said flame sensing means being operable in the event the flame becomes extinguished to control said enabling means to permit further enabling signals to be extended to said control electrode of said controlled switching means for enabling said controlled switching means, whereby said spark producing means is activated to effect the generation of further ignition sparks and to cause said control means to remain operated for a second duration after the flame is extinguished to thereby maintain said valve means energized for said second duration, said control meand deenergizing said valve means and said ignition means whenever a flame fails to be reestablished within said second duration.

3,947,221

PERSONAL PROTECTION DEVICE USING FLASHCUBES

Francis P. Mauser, 1014 Smithfield St., Parkersburg, W. Va. 26101

Filed Aug. 30, 1974, Ser. No. 502,019
Int. Cl.² F21K 5/02
U.S. Cl. 431—93 **13 Claims**



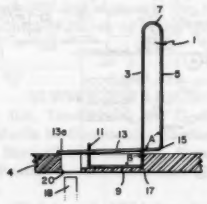
1. A personal defense attachment for use with a flashbulb unit of the type including a casing and at least one flashbulb having percussive flash means with a percussion striker arm engaging a detent which can fire the bulb responsive to movement of the striker arm off the detent, the casing having an aperture adjacent the striker arm, said attachment comprising a flexible arm, means to secure said flexible arm to the casing, a trigger lug on the flexible arm engageable through said aperture and being of sufficient length to engage the striker arm and move it off the detent when the flexible arm is flexed toward the aperture in the casing, a carrying ring, and means securing said carrying ring to the flexible arm in a position such as to allow a user's finger to be engaged therein and so that another finger on the same hand is operatively engageable with said flexible arm to flex said arm toward said aperture.

3,947,222

PHOTOGRAPHIC FLASHLAMP UNIT

John W. Shaffer, Williamsport, Pa., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Continuation of Ser. No. 861,126, Sept. 25, 1969, abandoned. This application Jan. 22, 1973, Ser. No. 325,601
Int. Cl.² F21K 5/02
U.S. Cl. 431—93 **7 Claims**



1. A photographic flashlamp unit comprising:

a plurality of percussively-ignitable flashlamps with primer tubes depending therefrom;

a plurality of folded torsional resilient devices for firing said flashlamps, each of said devices being disposed in operative relationship with respect to one of said flashlamps and each of said devices comprising a substantially hairpin torsional section having a projection of one leg thereof at a substantially normal but obtuse angle thereto defining a striker, a projection of the other leg thereof at a substantially normal but acute angle thereto defining a foot and a projection of said foot substantially normal thereto defining a latch, said striker crossing said latch whereby said latch restrains said striker in a cocked position; and a base on which said flashlamps and said folded torsional devices are mounted, said base having elongated

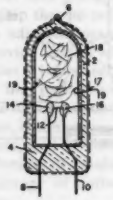
slots formed therein within which the foot of each of said folded torsional devices is seated, the free end of said latch projecting above the top face of said base and the free end of said striker bearing against the top face of said base, the configuration of said folded torsional device urging the free end of said striker downwardly against the top face of said base with a net force of greater than about one ounce, said force holding the free end of said striker in contact with the top face of said base.

3,947,223

PHOTOFLASH LAMP

Andre C. Bouchard, Peabody; John F. Waymouth, Marblehead; Thomas J. Sentementes, Wakefield, and Naila Saba Jirmanus, Somerville, all of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed July 10, 1974, Ser. No. 487,353
Int. Cl.² F21K *5/02*
U.S. Cl. 431—94 **25 Claims**



1. A photoflash lamp comprising:
an hermetically sealed, light-transmitting envelope;
a quantity of combustible material located in said envelope;
a combustion-supporting gas in said envelope, and
ignition means attached to said envelope and disposed in operative relationship to said combustible material;
said envelope comprising a material selected to have a thermal conductivity of less than 24×10^{-4} cal/cm-sec-°C at 100°C and a thermal diffusivity of less than 50×10^{-4} cm²/sec at 100°C so as to minimize conductive heat losses through said envelope occuring during the collision of molten droplets of said combustible material with the inner wall of said envelope during flashing of said lamp, whereby losses in radiative energy resulting from said droplet-wall collisions are minimized.

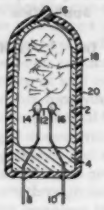
3,947,224

PHOTOFLASH LAMP WITH MODIFIED POLYCARBONATE COATING

John W. Shaffer, Williamsport, Pa., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed Nov. 1, 1974, Ser. No. 519,966
Int. Cl.² F21K *5/02*
U.S. Cl. 431—94 **9 Claims**

1. A photoflash lamp comprising an hermetically sealed glass envelope, a combustion supporting gas in said envelope, a quantity of combustible material located in said envelope, ignition means attached to said envelope and disposed in operative relationship to said combustible material, and a protective coating on the exterior surface of said glass envelope, said coating comprising a polycarbonate resin which is acidified to counteract any alkalicatalyzed hydrolysis of the



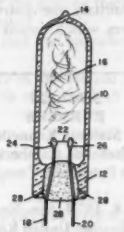
resin and thereby prolong the time to failure of said resin under conditions of high humidity and high mechanical stress.

3,947,225

PHOTOFLASH LAMP

Emery G. Audesse; Donald E. Armstrong, both of Williamsport, and Ronald E. Sindlinger, Muncy, all of Pa., assignors to GTE Sylvania Incorporated, Montoursville, Pa.

Filed Mar. 31, 1975, Ser. No. 563,933
Int. Cl.² F21K *5/02*
U.S. Cl. 431—95 R **13 Claims**



1. A photoflash lamp comprising:
an hermetically sealed envelope formed of a lead-containing glass having a first mean coefficient of thermal expansion;
a quantity of combustible material located within said envelope;
a combustion-supporting gas in said envelope;
an ignition structure disposed in said envelope in operative relationship with respect to said combustible material, said ignition structure including a pair of spaced apart lead-in wires sealed in one end of said envelope and a filament connected across said lead-in wires, said lead-in wires having a second mean coefficient of thermal expansion which is higher than said first mean coefficient;
and means for sealing said lead-in wires in said end of said envelope comprising a body of glass sealed between said lead-in wires and said envelope and supporting said wires in a spaced side-by-side relation, said body of glass having a third mean coefficient of thermal expansion which is intermediate said first and second mean coefficients.

3,947,226
COMBUSTION SYSTEM

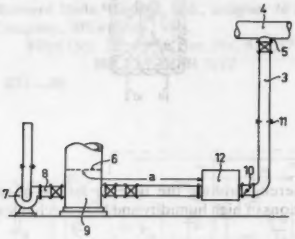
Ernst-Georg Neumann, Bochum-Querenburg; Giesbert Tewes, and Alfons Bader, both of Essen, all of Germany, assignors to Krupp-Koppers GmbH, Essen, Germany

Filed Oct. 2, 1974, Ser. No. 511,257

Claims priority, application Germany, Oct. 6, 1973, 2350338

Int. Cl.² F23D *15/02*

U.S. Cl. 431—114 **5 Claims**



1. In a combustion system, a combination comprising a combustion chamber; a burner communicating with said combustion chamber and tending in operation to produce vibrations; a conduit communicating with said burner and supplying thereto a stream of fuel fluid; and a compartment interposed in said conduit and having a volume equal to a multiple of the product of the cross-sectional area and the diameter of said conduit for reflexion of acoustical waves originating in said burner and tending to produce said vibrations, that portion of said conduit which connects said burner and said compartment being of unobstructed cross-section and having a length equal to substantialy one quarter of the wave length of said acoustical waves which would develop if vibrations were allowed to occur.

3,947,227
BURNERS

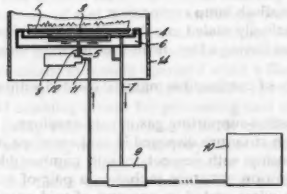
James Peter Granger, Staines; Kenneth Hirst, Kemsing, and David Montagu Whitehead, Camberly, all of England, assignors to The British Petroleum Company Limited, London, England

Filed Jan. 8, 1974, Ser. No. 431,607

Claims priority, application United Kingdom, Jan. 15, 1973, 1986/73

Int. Cl.² F23D *5/12*

U.S. Cl. 431—118 **9 Claims**



1. A burner comprising: a burner element formed of a slab of material which is adapted and arranged to hold liquid fuel by capillary action and defining air passageways therethrough for the passage of combustion air to a combustion zone at the surface of the burner element; means supplying fuel under pressure in said element in an amount in excess of that required to saturate said element thereby to cause the element to be flushed and to remove carbon build up therefrom during the entire normal operation of the burner, said excess fuel dripping from the underside of the element said means including an elongated pipe having a plurality of orifices abutting the burner slab material and directed toward the combustion zone for directing the fuel into the burner slab material; and means for collecting and recycling the excess fuel to said supplying means; the combustion air and fuel vapors from the burner element being mixed and reacted above said element.

3,947,228
MEANS FOR BURNING A LIQUID FUEL

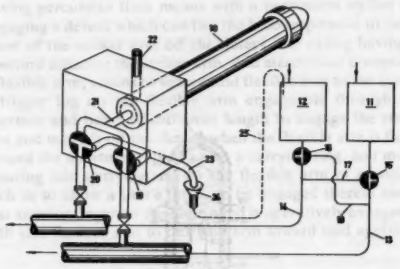
Hans Stenlund, Molndal, Sweden, assignor to Gotaverken Angteknik AB, Goteborg, Sweden

Filed Jan. 28, 1975, Ser. No. 544,792

Claims priority, application Sweden, Feb. 19, 1974, 7402134

Int. Cl.² F23D *11/38*

U.S. Cl. 431—121 **1 Claim**



1. In a means for burning a liquid fuel of the kind having a tendency to cause deposits, said means including a first storage tank for the liquid fuel, a second storage tank for a washing fluid, at least one burner having a head and an elongated lance body attached thereto, two main supply conduits running from the two storage tanks to said burner, and valve means for connecting at will the said main supply conduits to said storage tanks in such a manner that any of said supply conduits will convey liquid fuel, while the other supply conduit simultaneously conveys washing fluid, the improvement that the burner head is connected to the two main supply conduits and includes two three-way valves fitted adjacent to the lance body, as well as a return flow conduit for the washing fluid, the arrangement permitting the lance body to be connected to the main conduit momentarily supplying fuel by way of one of the three-way valves, while the other three-way valve connects the second main supply conduit, momentarily transporting the washing liquid, with the return flow conduit.

3,947,229
GAS BURNER

Enrique Kusminsky Richter, J. E. Uribury 262, Buenos Aires, Argentina

Filed Jan. 31, 1975, Ser. No. 546,171

Int. Cl.² F24L *3/04*

U.S. Cl. 431—125 **6 Claims**

1. An unvented, open-flame type room heater comprising:

a. a container

i. made of a refractory material,

ii. having a chamber therewithin, and

iii. having an open face on the top thereof;

b. a plate

i. made of a refractory material,

ii. mounted in said container so as to divide the chamber therewithin into upper and lower volumes, and

iii. having a myriad of tiny passageways therein leading from the lower volume to the upper volume;

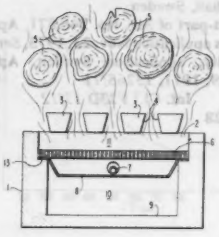
c. means for introducing gas and air into the lower volume;

d. a plurality of bars

i. made of refractory material,

ii. spanning the open face of said container in parallel, spaced array, and

iii. shaped such that the sides of their longitudinal cross sections converge towards the chamber in said container; and



e. a plurality of simulated logs

i. located on top of said plurality of bars in generally parallel relationship thereto and

ii. in contact with adjacent logs along portions of their exteriors, but leaving passageways therebetween,

whereby, when the heater is being used, the gas and air passes through the myriad of tiny passageways in said plate and is burned in three separate locations, namely, between said plate and said plurality of bars, in the spaces between adjacent ones of said plurality of bars, and in the passageways between adjacent ones of said plurality of simulated logs, thereby virtually eliminating the passage of carbon monoxide into the surrounding atmosphere.

3,947,230

COMBUSTION CHAMBER DEVICE WITH A ROTARY CUP-SHAPED FUEL-SPREADER

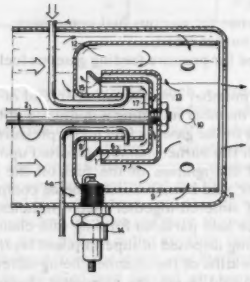
Karl-Axel Zetterström, Trollhattan, and David Sten Börje Brengdahl, Staffanstorp, both of Sweden, assignors to Volvo Flygmotor Aktiebolag, Trollhattan, Sweden

Filed Sept. 17, 1974, Ser. No. 506,928

Claims priority, application Sweden, Sept. 19, 1973, 73127607; July 4, 1974, 7408834

Int. Cl.² F23D *11/04*

U.S. Cl. 431—168 **7 Claims**



1. A combustion chamber device comprising in combination:

a. a fuel spreader element in the form of a generally cup-shaped member that has a generally cylindrical side section, a perforated bottom section, and an open top section,

b. a generally cylindrical air passageway disposed concentrically within said fuel spreader element so that the open discharge end of said air passageway is positioned at a spaced distance away from the aforesaid perforated bottom section of said generally cup-shaped fuel spreader element so that the air introduced through said passageway can flow both through said perforations and through the space between the outer surface of said air passageway and the inner surface of said cup-shaped member,

c. a non-rotating conduit for supplying a liquid fuel to the interior surface of said cup-shaped fuel spreader,

d. a cap member arranged concentrically around the sides and bottom of said cup-shaped fuel spreader element and spaced therefrom so as to form an annular passageway for the flow of air that enters through said air passageway and that passes through the openings in the bottom of said perforated bottom section,

e. a generally cylindrical combustion chamber wall disposed concentrically around said cup member and spaced therefrom so as to form an annular zone for the admixture and burning of fuel and air,

f. one end of said combustion chamber wall terminating in a discharge outlet for combustion gases,

g. the other end of said combustion chamber wall being provided with a inwardly extending end wall member that serves to reverse the direction of flow of the fuel vapors and air exiting from the open top section of said cup-shaped member and the air flowing between the outside of said cup-shaped member and the inside of said cap member to reverse its direction of flow and pass back over the outer sides of said cap member toward said discharge outlet,

h. a circumferential shoulder disposed around the open top section of the cup-shaped fuel spreader element, said shoulder having a radial thickness sufficient to maintain a layer of fuel of the desired thickness on the sides of the cup-shaped member,

i. means to rotate said fuel spreader element about its axis, and

j. an ignition device in the annular zone between the inside of the combustion chamber wall and the exterior of said cap member.

3,947,231

PILOT LIGHT SYSTEM FOR LIGHTING A MAIN BURNER FOR HEATING HIGH VELOCITY HIGH PRESSURE TURBULENT AIR

Ivan L. Smith, Port Arthur, Tex., assignor to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 368,797, June 11, 1973, abandoned, which is a division of Ser. No. 201,011, Nov. 22, 1971, Pat. No. 3,768,964. This application July 31, 1974, Ser. No. 493,299

Int. Cl.² F23Q *9/00*

U.S. Cl. 431—285 **3 Claims**

1. A system for lighting a main burner having a diffuser for heating high velocity high pressure turbulent air comprising,

a. line means for supplying both high pressure air and fuel gas to a mixing chamber means,

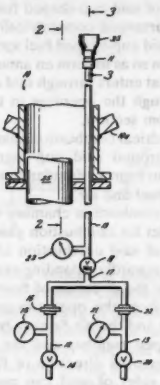
b. orifice-diffuser pilot means within said main burner diffuser comprising a pilot with an orifice plate means having a plurality of orifices mounted in the upstream mixture intake portion thereof and with a diffuser mounted on the downstream flame exit portion thereof for instant ignition of the positive pressure combustion chambered burner means,

c. precisely formed sharp edge restrictive orifice means in said air supply line means for passing said high pressure air therethrough and downstream to said mixing chamber means,

d. second precisely formed sharp edge restrictive orifice means in said gas supply line means for passing high pressure fuel gas therethrough and downstream to said mixing chamber means,

e. valve means in both said air and gas supply line means for controlling the upstream supply of said air and fuel gas through their respective sharp edge restrictive orifices,

f. air pressure gauge means and gas pressure gauge means in their respective air and gas supply line means intermediate their respective precisely formed sharp edge restrictive orifice means and their respective valve means,



g. air flow control means comprising said air precisely formed sharp edge restrictive orifice means, said air pressure gauge means, and said air valve means,

h. gas flow control means comprising said gas precisely formed sharp edge restrictive orifice means, said gas pressure gauge means, and said gas valve means, and

i. both said air flow control means and said gas flow control means comprising a means generating a combustion mixture down to a pressure of at least 55 percent of the pressure upstream of said orifices for instantly lighting said orifice-diffuser pilot means.

3,947,232

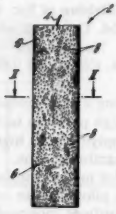
DECORATIVE CANDLE AND METHOD OF MANUFACTURE THEREFOR

Donald Foster, 215 Wells St., Peekskill, N.Y. 10566

Filed July 18, 1974, Ser. No. 489,507

Int. Cl.² C11C *5/00*

U.S. Cl. 431—288 **4 Claims**



1. A process for making a decorative candle of generally cylindrical shape comprising melting candle material at or above its melting point to a liquid phase cooling said liquid candle material to a temperature and for a time such that a film is formed on the surface of said liquid candle material, gently mixing the liquid and film phases of said candle material and thereafter pouring said mixed candle material into a cylindrical candle mold from a height of at least 50% greater than the height of the mold, cooling to a solid phase, and removing the resulting candle from said mold.

3,947,233

FREE-BURNING EQUIPMENT

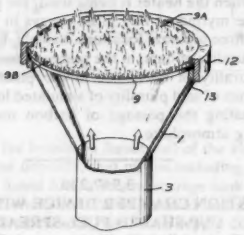
Carl Axel Sundberg, Kallhall, Sweden, assignor to C. A. Sundberg AB, Kallhall, Sweden

Continuation-in-part of Ser. No. 246,871, April 24, 1972, abandoned. This application Nov. 23, 1973, Ser. No. 418,274

Claims priority, application Sweden, Apr. 26, 1971, 5346/71; Nov. 29, 1971, 15265/71

Int. Cl.² F23D *13/12*

U.S. Cl. 431—328 **19 Claims**



13. A burner for gaseous fuel comprising:

a hollow burner stand;

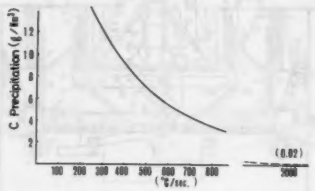
a feed pipe for pressure feeding gaseous fuel into said stand; and

a burner member covering an open end of said stand, said burner member including a multitude of channels for the passage of the gaseous fuel under pressure from the stand through the burner member directed upon the inner side thereof for ignition of the fuel on the outside of said member, said burner member being composed of a multitude of sintered-together metal particles, the interstices between said particles forming said channels, said particles being disposed in superimposed layers, the cross-sectional widths of the channels being different in different ones of said layers, the narrowest channels being in the outermost layer, the channels in the layer including the widest channels having a width of about 20 μ, the layer including the widest channels having a thickness of about 3 mm and the layer including the narrowest channels having a thickness between about 0.1 mm and 1 mm.

3,947,234
METHOD OF RAISING THE TEMPERATURE OF REDUCING GAS CONTAINING CO COMPONENT

Kenjiro Kanbara; Masayuki Hattori, and Jihei Yoda, all of Himeji, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Aug. 8, 1974, Ser. No. 496,026
Claims priority, application Japan, Aug. 11, 1973, 48-90338; Sept. 1, 1973, 48-98616
Int. Cl.² F24D 23/02
U.S. Cl. 432—2 3 Claims

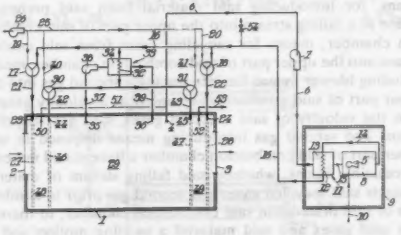


1. In a method for heating a reducing gas having CO as a component thereof to a temperature in excess of 500°C, the improvement which comprises heating the reducing gas at a rate greater than 350°/sec while the temperature of the gas is passing through the temperature range of 500°–750°C.

3,947,235
METHOD AND INSTALLATION FOR THE STOVING OF ARTICLES

Paul Bornert, La Celle-Saint-Cloud, France, assignor to Air Industrie, France

Filed Nov. 14, 1974, Ser. No. 523,843
Claims priority, application France, Nov. 15, 1973, 73.40717
Int. Cl.² F27D 17/00; B08B 15/00
U.S. Cl. 432—2 13 Claims

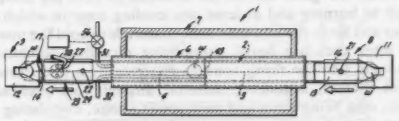


1. A method of stoving articles, such as freshly painted articles, which enter a stove and may undergo other preceeding or subsequent treatment in one or more enclosures, and in which combustion is used to eliminate a substantial proportion of the polluting and solvent-charged products given off by the articles during stoving and entrained by the ventilating air which is evacuated from the stove, said stoving being carried out in a stove including an inlet aperture through which the articles enter the stove and an outlet aperture from which the articles are discharged from the stove, said method comprising reintroducing the purified and heated air supplied by the combustion of the polluting products into the stove in the form of two gaseous curtains, one adjacent the inlet aperture and the other adjacent the outlet aperture, mixing said purified and heated air with fresh air prior to reintroduction into the stove, preheating the ventilating air in a heat exchanger prior to combustion, and supplying heat to said heat exchanger from said purified and heated gas.

8. A stoving installation for stoving articles, such as painted articles, comprising a stove having an aperture through which the articles to be stoved enter, an aperture through which the articles are discharged, and at least one evacuating aperture for the ventilating air which entrains a substantial portion of the polluting, solvent-charged products given off by the articles during stoving, and a burner connected through an evacuation conduit to the evacuating aperture for combusting said ventilating air and said products entrained therein and producing purified combustion gas, said installation comprising a first heat exchanger including a heat source disposed in the path of the ventilating air coming from said evacuation aperture and connected to a return conduit, means for supplying heat from said purified combustion gas coming from said burner to said heat source of said first heat exchanger, first and second air mixers connected to said return conduit and supplied with fresh air, the outlet paths of said air mixers being connected respectively to first and second purified air inlets for said stove so as to form first and second hot gaseous curtains, said first inlet being disposed adjacent the aperture through which the articles enter and said second inlet being disposed adjacent the aperture through which the articles are discharged.

3,947,236
FLUID BEARING TRANSFER AND HEAT TREATING APPARATUS AND METHOD

Cecil A. Lasch, Jr., 20200 Lucille Drive, Cupertino, Calif. 95014

Continuation of Ser. No. 203,086, Nov. 29, 1971, abandoned.
This application Mar. 21, 1974, Ser. No. 453,213
Int. Cl.² F27D 3/00
U.S. Cl. 432—11 27 Claims

1. A method of handling articles, such as silicon wafers, to support and transfer the same on a fluid supporting and transporting cushion at varied predetermined rates of movement under positive control conditions between two stations, comprising

A. supporting an article on a fluid bearing emanating solely through a base surface of a track structure over which said article is to pass,

B. moving said article along a first predetermined and operatively discrete portion of said track structure by introducing a quantity of article supporting and transporting fluid therethrough and causing said fluid to move in a predetermined direction to support said article solely by said fluid emanating through said base surface and to move the same positively in said direction,

C. moving said article along a second predetermined and operatively discrete portion of said track structure by introducing a quantity of article supporting and transporting fluid therethrough and causing said fluid to move in a predetermined direction to support said article solely by said fluid emanating through base surface and to move the same positively in said direction,

D. altering the rate at which said article moves on said second portion of said track structure in said direction by altering the flow of supporting and transporting fluid emanating through said base surface of such track structure portion, and thereafter

E. continuing movement of said article along said second portion of said track structure in said direction for a

predetermined period of time by introducing additional bearing fluid thereagainst through said base surface of said second portion of said track structure.

3,947,237

METHOD AND APPARATUS FOR CONTROLLING THE AIR VOLUME IN A TUNNEL KILN ACCORDING TO THE BATCH DENSITY

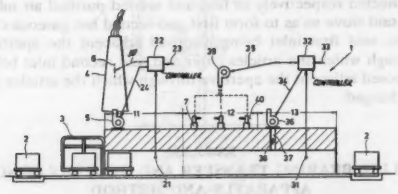
Manfred Leisenberg, Giessener Strasse 46, 6312 Laubach, Hesse, Germany

Filed Nov. 8, 1974, Ser. No. 522,315

Claims priority, application Germany, Nov. 15, 1973, 2357057

Int. Cl.[2] F27D *3/00*; F27B *9/00*

U.S. Cl. 432—11 10 Claims



1. A method of controlling the gases in a kiln in which ceramic materials are advanced through the kiln for burning therein in various quantities and at varying rates, said kiln having a firing zone in at least one adjacent preheating zone in which the gases act on the material to heat the material prior to burning and at least one cooling zone in which the gases and air in the kiln act on the materials to cool the materials after they are burnt, comprising directing combustion products into the firing zone to generate high temperatures gases therein, advancing material through said preheating zone, said firing zone and said cooling zone, circulating the gases to preheat the material to be burnt in the preheating zone, circulating gases in the cooling zone along with air to cool the material after it is burnt in the firing zone, withdrawing a portion of the gases generated during the movement of the material through the kiln after giving up some of the heat in the kiln and directing them upwardly through a gas exhaust flue, sensing the temperature in at least one select location in said kiln, comparing the sensed temperature with a previously sensed temperature condition in the same select location so as to sense any change in quantity of material being fed thereby, and changing the quantity of gases which are withdrawn from the flue in accordance with the differences in sensed temperature conditions.

6. A tunnel tiln for ceramic materials, comprising a tunnel housing having an entrance end and an opposite discharge end, burner means on said tunnel housing firing into the interior of said tunnel housing in an intermediate firing zone to generate high temperature gases to burn the ceramic materials therein, the interior of said tunnel housing having a preheating zone before and a cooling zone after said firing zone, means for circulating the high temperature gases and cooling air so as to preheat materials in said preheating zone and to cool the burnt material in said cooling zone, a flue connected to the interior of said tunnel housing, gas flow control means in said flue for controlling the rate of withdrawal of gases through said flue, temperature sensing means in said tunnel housing, and a controller connected to said temperature sensing means and to said gas flow control means and being responsive to a change in temperature which is sensed to regulate the gas flow control means and to thereby vary the amount of gases and air which are withdrawn through said flue.

3,947,238

METHOD AND APPARATUS FOR DISPERSING POWERED MATERIAL IN A COMBUSTION CHAMBER

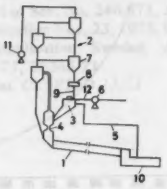
Yoshiharu Fukuda, Tokyo, and Yoshihiko Ueda, Musashino, both of Japan, assignors to Onoda Cement Co., Ltd., Onoda, Japan

Filed Oct. 25, 1974, Ser. No. 518,046

Claims priority, application Japan, Oct. 29, 1973, 48-121370

Int. Cl.[2] F27B *15/00*

U.S. Cl. 432—14 6 Claims



1. A method of thoroughly dispersing powdered material into a combustion chamber of a furnace, wherein said material is introduced into the top of said combustion chamber from a suspension preheater including air exhaust means, and wherein said material is combusted in said combustion chamber and is passed to a calcining chamber and cooling zone, and wherein gases from said cooling zone are recycled to said combustion chamber, comprising introducing said recycled gases to the upper zone of said combustion chamber, introducing a second gas into said upper zone at a velocity greater than said entering recycled gases, introducing said material as a free falling stream into said upper zone of said combustion chamber and contacting said free falling stream of material with said recycled gases and second gas prior to combustion of said material in said combustion chamber, to thereby give said gases and material a swirling motion and to thoroughly disperse said material in said chamber.

6. An apparatus for thoroughly dispersing powdered material into a combustion chamber of a furnace wherein combustion thereof takes place, comprising, in combination, suspension preheater means, furnace means, kiln means, and cooling means, for introducing said material from said preheater means as a falling stream into the upper part of said combustion chamber, means for recycling gases from said cooling means into the upper part of said combustion chamber, means including blower means for introducing a second gas into the upper part of said combustion chamber at a velocity greater than the velocity of said recycled gases, said gas recycling means and second gas introducing means disposed in said upper part of said combustion chamber adjacent said material introducing means, whereby said falling stream of material contacts said recycled gases and second gas prior to combustion of said material in said combustion chamber, to thereby give said gases and said material a swirling motion and to thoroughly disperse said material in said chamber.

3,947,239

DESCENDING BED OF SUB-DIVIDED SOLID MATERIAL

Philip Henry Nelson, The Old Rectory, Snargate, Romney Marsh, Kent TN29 OEW, England

Filed Nov. 1, 1974, Ser. No. 520,170

Claims priority, application United Kingdom, Nov. 12, 1973, 52385/73

Int. Cl.[2] F27B *15/00*, *1/26*

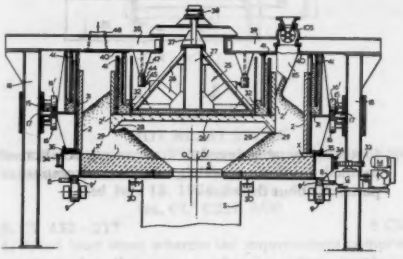
U.S. Cl. 432—14 17 Claims

1. The method of treating loose solid material in a generally upright annular bed formed between substantially coaxial inner and outer cylindrical walls spaced from each other by a radial bed width *a*, said bed being further supported on an annular floor having a central aperture and a substantially flat, peripheral region with a region sloping from the peripheral region downward toward the central aperture, the outer wall

being in gas-tight sliding relationship with the flat peripheral region of the floor and the inner wall being positioned with its bottom edge at a height h above the bottom edge of the outer wall and rotationally free with respect to the outer wall, comprising the steps of

a. establishing and maintaining a bed of loose solid material by supplying loose solids to said annular chamber,

b. rotating said floor on an axis radially offset from the axis of the annular chamber,



c. passing a gas in counterflow with the material in said annular bed,

d. discharging treated solids from said annular bed through the central aperture in said floor, and

e. establishing and maintaining a stable critical mode by modulating at least one of said height h and the angle of repose ϕ of the treated material at the bottom of the bed to maintain the relationship in which tan ϕ is in the range between h/a and 1.1 × h/a.

3,947,240

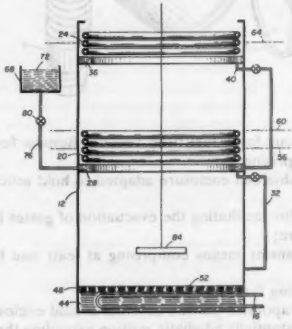
METHOD AND APPARATUS FOR GENERATING A VAPOR FOR SOLDERING, FUSING OR BRAZING ARTICLES

Robert C. Pfahl, Jr., Glen Ellyn, Ill., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Nov. 1, 1974, Ser. No. 520,182

Int. Cl.² F27D *17/00*

U.S. Cl. 432—28 **6 Claims**



1. In a method of establishing a body of condensible vapor of a heat transfer liquid at an elevated temperature, to be condensed on an article to heat the article by the transfer of the latent heat of vaporization thereof to the article:

heating a liquifiable metal, having a density greater than the density of the heat transfer liquid and a melting point below the elevated temperature, to at least the elevated temperature to form a pool of molten metal, and

floating a layer of the heat transfer liquid, which boils at the elevated temperature, on the pool of molten metal to form a stratified layer of the heat transfer liquid on the pool of molten metal, to heat and to boil the heat transfer liquid to form the body of condensible vapor of the heat transfer liquid, at the elevated temperature, above the heat transfer liquid.

5. In an apparatus for generating a body of a condensible vapor of a heat transfer liquid for heating an article extended therein by the transfer of the latent heat of vaporization of the vapor to the article:

a vessel, open to the atmosphere;

a supply of the heat transfer liquid and a liquifiable metal in the lower end of the vessel, the heat transfer liquid having a density less than the density of the metal and the vapors of the heat transfer liquid having a density greater than air at atmospheric pressure, and the liquifiable metal having a melting point below, and a boiling point above, the boiling point of the heat transfer liquid, and

means for heating the heat transfer liquid and the liquifiable metal in the lower end of the vessel to melt the liquifiable metal to form a pool of molten metal with the less dense heat transfer liquid stratified on top of the pool of molten metal, and to boil the heat transfer liquid to generate thereabove in the upper portion of the vessel the condensible vapors of the heat transfer liquid.

3,947,241

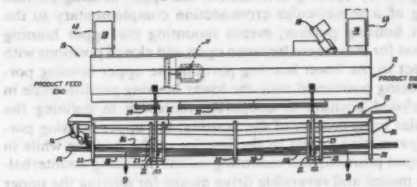
FOOD TREATMENT APPARATUS AND PROCESS

Andrew A. Caridis, Foster City, and Clark K. Benson, Millbrae, both of Calif., assignors to Heat and Control, Inc., San Francisco, Calif.

Continuation of Ser. No. 328,925, Feb. 2, 1973, abandoned. This application Jan. 27, 1975, Ser. No. 544,393

Int. Cl.² F27B *9/00, 9/14*

U.S. Cl. 432—121 **11 Claims**



1. An oven operative at substantially atmospheric pressure for food treatment comprising an elongate oven housing having top, bottom, side and end walls, means serving to supply a process vapor into said housing, a partition dividing said housing into a proces vapor heating chamber and a food processing chamber, said housing end walls having openings therein defining product inlets and outlets to said processing chamber, at least one exhaust opening on said housing, baffle members arranged in said oven and coacting with the wall portions thereof to furnish a flow passageway from said product inlet to the exhaust opening and from said product outlet to the exhaust opening, said exhaust opening and baffle member permitting a draft to sweep air entering said oven through said product inlet and said product outlet up through said exhaust opening and out of the oven serving to control air from entry into the process vapor, said conveyor means including a conveyor belt arranged to carry solid food products thereon through processing chamber and being of previous construction to permit circulation therethrough of the process vapor, first power means serving to drive said conveyor means, heating means arranged in said heating chamber serving to raise and maintain the vapor therein at a selected processing temperature, means for positively circulating the process vapor, second power means serving to drive said vapor circulating means, baffle means coacting with said partition

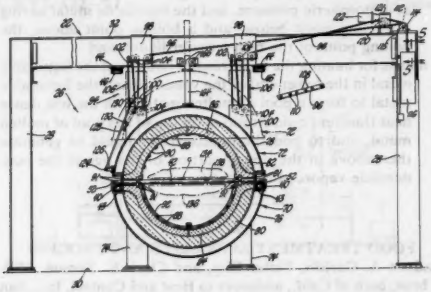
serving to permit said circulating means to generate a draft of the process vapor from said heating compartment through said process compartment and along said conveyor and thence serving to effect recirculated return of the process vapor to said heating chamber.

3,947,242

ROLLER HEARTH FURNACE FOR GLASS SHEETS

Harold A. McMaster, 707 Riverside Drive, Woodville, Ohio 43469, and Norman C. Nitschke, 9102 Buck Road, Perrysburg, Ohio 43551

Filed Feb. 19, 1975, Ser. No. 551,450
Int. Cl.² F27B 9/14
U.S. Cl. 432—122 **29 Claims**



1. A roller hearth glass furnace for heating sheets of glass, the furnace comprising: a horizontally elongated housing of a hollow construction having a circular cross-section; the housing including upper and lower portions of semicircular cross-sections; the lower housing portion being fixedly mounted in an upwardly opening orientation; the upper housing portion being of a semicircular cross-section complementary to the lower housing portion; means mounting the upper housing portion for movement between open and closed positions with respect to the lower housing portion; the upper housing portion being positioned over the lower housing portion while in the closed position to cooperate therewith in defining the circular cross-section of the housing; the upper housing portion permitting access to the interior of the housing while in the open position; said mounting means including counterbalance means and reversible drive means for moving the upper housing portion between its open and closed positions along a predetermined path; roller conveyor means for carrying sheets of glass horizontally through the housing with the planes thereof oriented horizontally and located at the juncture between the upper and lower housing portions; and heating means on both the upper and lower housing portions so as to uniformly heat the sheets of glass on both sides thereof upon being conveyed through the furnace.

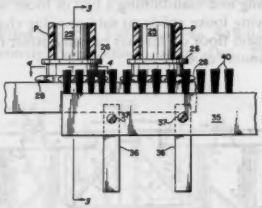
3,947,243

OVEN WITH PARISON ROTATING MEANS

Nickolas N. Sokolow, Cheshire, Mass., assignor to Beloit Corporation, Beloit, Wis.

Filed Dec. 30, 1974, Ser. No. 537,280
Int. Cl.² F27B 9/14
U.S. Cl. 432—124 **17 Claims**

1. An oven for heating tubular parisons comprising:
an oven housing,
means for heating the interior of the oven housing,
a transport means for transporting the parisons along a path through the oven housing,
turning means for turning the tubular parisons about their axes as they travel through the oven housing, said turning means comprising a toothed rotatable member operatively associated with each parison such that its respective parison rotates therewith,
and a group of stiff bristles positioned alongside at least a portion of the said path through the oven housing close enough to the path to be engaged by the teeth of said



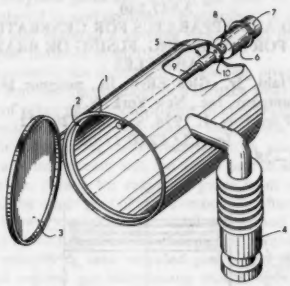
toothed rotatable member for causing rotation of the toothed rotatable member and hence rotation of the parisons about their axes.

3,947,244

HEAP PIPE VACUUM FURNACE

Lazaros J. Lazaridis, Lincoln, Mass., assignor to Thermo Electron Corporation, Waltham, Mass.

Continuation of Ser. No. 186,605, Oct. 5, 1971, abandoned.
This application Nov. 20, 1973, Ser. No. 417,653
Int. Cl. F27b 5/04; F28d 15/00
U.S. Cl. 432—205 **11 Claims**



1. A gaseous fossil fuel fired vacuum furnace for heating articles comprising:
a. a heat shielded enclosure adapted to hold articles to be heated;
b. means for facilitating the evacuation of gasses from said enclosure;
c. heat transfer means comprising at least one heat pipe having:
1. working fluid therein;
2. an evaporator portion external of said enclosure;
3. a substantially adiabatic portion extending through the wall of said enclosure;
4. a condenser portion internal of said enclosure forming a substantially isothermal surface for radiating heat energy to articles within said enclosure; and
5. means containing working fluid in the liquid phase and permitting movement thereof from said condenser portion to said evaporator portion; and
d. gaseous fossil fuel fired burner means external of said enclosure for directing products of combustion onto said evaporator portion and vaporizing working fluid therein,

whereby working fluid vapor from said evaporator portion condenses in said condenser portion to transfer heat energy from combustion of gaseous fossil fuel to said condenser portion for radiation therefrom to articles interior of said heat shielded enclosure.

3,947,245

HOT BLAST STOVE

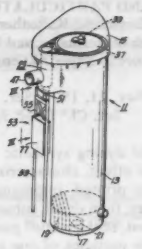
Robert E. Zimmermann, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed July 15, 1974, Ser. No. 488,425
Int. Cl.² C21B 9/00
U.S. Cl. 432—217 5 Claims

1. A hot blast stove wherein the improvement comprises:

a a vertical shell structure embracing a first chamber containing a plurality of checker bricks;

b a second chamber wherein heat is generated that is located alongside of and contiguous with the top portion of said second chamber and with a common upper portion of said shell embracing said second chamber, said second chamber being shorter than said first chamber; and



c a domed top covering said first and second chambers and comprising a conduit for said heat to flow into said first chamber.

3,947,246

PROCESS FOR PRODUCING SPOTTED DYEINGS WITH PASTES CONTAINING WATER-SOLUBLE RESIN OR WAX AND PARTICULATE DYESTUFF

Johannes Eibl, Burscheid-Kaltenherberg; Karlheinz Wolf, Leverkusen, both of Germany, and Helmut Prochaska, Warren, N.J., assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 21, 1973, Ser. No. 417,745
Int. Cl.² D06P *3/00*
U.S. Cl. 8—62 9 Claims

1. A process for dyeing synthetic fibre materials so as to produce a spotted effect, characterized in that the synthetic fibre materials are printed, impregnated, sprayed or coated with dyestuff pastes, then dried, subjected to a thermofixation process and washed, said dyestuff pastes containing insoluble or scarcely soluble particles of one or a plurality of dyestuff preparations, said particles having a size of 10μ to 200μ, and said dyestuff preparations consisting of a dyestuff, a resin or wax which is insoluble or scarcely soluble in water and optionally of a softener and/or tenside.

3,947,247

STABILIZER COMPOSITION FOR DYESTUFFS

Robert E. Kohrman, and Pratap G. Phadtare, both of Mount Pleasant, Mich., assignors to Central Michigan University Board of Trustees, Mount Pleasant, Mich.

Filed Oct. 31, 1973, Ser. No. 411,195
Int. Cl.² C09B *27/00*; B01F *17/16*
U.S. Cl. 8—44 10 Claims

1. A stabilizer composition composition consisting essentially of the condensation reaction product, in the presence of a non-acid medium, of a quaternary aromatic heterocyclic nitrogeneous compound and an azoitized aromatic amine.

9. A dyestuff consisting essentially of a naphthol coupled with the stabilizer of claim 1.

3,947,248

CLARIFICATION OF AQUEOUS WASTE STREAMS CONTAINING DISPERSED DYES

J. Bruce Powers, Williamsburg, Va., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 26, 1973, Ser. No. 410,077
Int. Cl.² D06P *5/00*
U.S. Cl. 8—81 8 Claims

1. A process for decolorizing acidic, aqueous waste dye streams having minor amounts of organic dye or dyes dispersed with an anionic surfactant in an aqueous media at a pH of up to about 4.5 at a temperature of from ambient up to about 50°C, said process comprising the steps of (1) adding a water-soluble cationic polymer to the waste stream in an amount sufficient to neutralize substantially all negative charges associated with the dispersed dye or dyes thereby causing a solid floc to form, and (2) separating the solid floc formed in step (1) from the effluent.

3,947,249

STERILIZING DEVICE FOR WEB SHAPED PACKAGING MATERIAL

Hermann Egger, Fribourg, Switzerland, assignor to Quepor S.A., Fribourg, Switzerland

Filed Apr. 15, 1974, Ser. No. 461,237
Claims priority, application Italy, Apr. 20, 1973, 49592/73
Int. Cl.² A61L *3/00*, *13/04*; B65B *55/10*
U.S. Cl. 21—92 6 Claims

1. In a sterilizing device for web shaped packaging material comprising applying means for applying a sterilant film to a web and a drying chamber means for evaporating sterilant from the web, the improvement wherein said device further comprises:

path lengthening means interposed between the applying means and the drying chamber means for increasing the length of the path of travel of the web therebetween; and

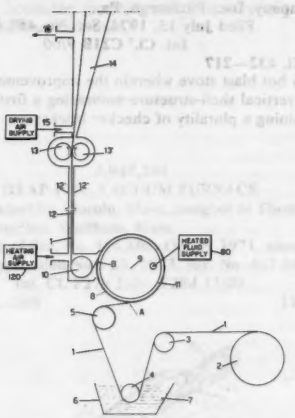
heating means for heating said sterilant film along at least a part of said path of travel between the applying means and the drying chamber means, without substantially evaporating the sterilant film,

wherein said path lengthening means include

a cylinder interposed in said path and contacting the web, and

deflecting means for directing the web into contact with said cylinder along a part of the circumference thereof and wherein said heating means include

means for heating said cylinder to a temperature sufficient to increase the sterilization activity of the sterilant



film on the web without causing substantial evaporation thereof,

an enclosure means for enclosing the web for at least a portion of the path of travel between the applying means and the drying chamber means, said enclosure means at least partially surrounding the circumference of said cylinder and extending substantially to the entrance of the web into the drying chamber means, said enclosure means substantially completely enclosing the web therein and having a narrow slit at the end thereof at which the web exits to the drying chamber means, thereby substantially thermally isolating the drying chamber means from said enclosure means; and

enclosure heating means for heating the sterilant film of the web within said enclosure means without causing substantial evaporation thereof.

3,947,250

METHOD OF IMMUNODIFFUSION

Vincent A. Pollack, Annaheim, Calif., assignor to Baxter Laboratories, Inc., Deerfield, Ill.

Filed June 21, 1974, Ser. No. 481,621
Int. Cl.² A61K *37/00*; B01J *13/00*; G01N *31/02*, *33/16*
U.S. Cl. 23—230 B 9 Claims

1. In the method of immunodiffusion employing an aqueous gel medium containing from about 0.1 to about 5% by weight of a gelling agent for the determination of low levels of protein diffusion of said protein in said gel medium, the improvement comprising incorporating in the gel medium in order to enhance visibility of diffusion rings when testing for proteins of low concentration from about 0.5 to about 5% by weight of the medium of a block copolymer having the formula $HO(C_2$.

$H_4O)_a(C_2H_4O)_a(C_3H_4O)_bH$ wherein *a* is an integer such that the hydrophobe base represented by (C_3H_6O) has a molecular weight of at least 950 and *b* in an integer such that the hydrophile portion represented by (C_2H_4O) constitutes from about 50 to about 90% by weight of the compound.

5. A composition of matter for use with an immunodiffusion plate for the determination of low levels of protein concentration in blood serum comprising a gel medium containing a predetermined amount of antigen or antibody, from about 0.1 to about 5% by weight of a gelling agent selected from the group consisting of agar, agarose, and mixtures thereof, and from about 0.5 to about 5% by weight of a block copolymer having the formula $HO(C_2H_4O)_b(C_3H_6O)_a(C_2H_4O)_bH$ wherein *a* is an integer such that the hydrophobe base represented by (C_3H_6O) has a molecular weight of at least 950 and *b* is an integer such that the hydrophile portion represented by (C_2H_4O) constitutes from about 50 to about 90% by weight of the compound.

3,947,251

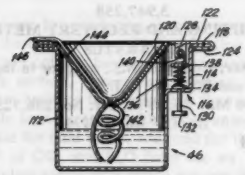
LABORATORY CONTAINER

Babington A. Quame, 331 E. 29th St., New York, N.Y. 10016

Division of Ser. No. 294,849, Oct. 4, 1972, Pat. No. 3,843,323. This application Oct. 16, 1974, Ser. No. 515,355

Int. Cl.² B01L *3/00*

U.S. Cl. 23—259 **3 Claims**



1. For use in the testing of liquid samples, a container having an open top, funnel means closing said open top of said container for directing liquid into the interior of the latter, means carried by said funnel means for preventing the contents of the container from spilling out through said funnel means when said container and funnel means therewith are inverted, valve means carried by said container and communicating with the interior thereof for discharging liquid from the interior of the container when the latter is inverted and means for admitting air into the interior of the container beneath the funnel means.

3,947,252

ELASTIC SUSPENSION OR SUPPORT FOR A CERAMIC MONOLITHIC CATALYZER BODY

Reimar Musall, and Wilhelm Wolsing, both of Hannover, Germany, assignors to Kali-Chemie AG, Hannover, Germany

Filed Apr. 9, 1973, Ser. No. 349,477

Claims priority, application Germany, Apr. 7, 1972, 2216644

Int. Cl.² B01J *8/00;* **F01N** *3/15*

U.S. Cl. 23—288 FC **9 Claims**

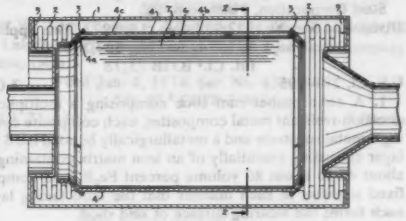
1. An apparatus for decontaminating exhaust gases comprising a monolithic catalyst body suitable for removing toxic gases from an exhaust gas passage, including

an elastic holder, resiliently suspending said monolithic catalyst body, comprising:

a rigid metallic housing having an inlet opening and an outlet opening and forming the outer wall of said exhaust gas passage;

resilient means operable to provide resilient pressure to a support means and being disposed within said housing near said openings;

a sleeve circumferentially disposed about the monolithic catalyst body and disposed in said housing therewith and including means operable to restrain substantial axial movement of the body relative to the sleeve, and



said support means operable to support said sleeve, being disposed near an end of said sleeve and being operably engaged with said resilient means, said support means and said sleeve having matching annular chamfers at adjacent ends thereof interengaging under the pressure of said resilient means whereby said support means supports and centers said sleeve.

3,947,253

CATALYTIC EXHAUST GAS PURIFICATION DEVICE

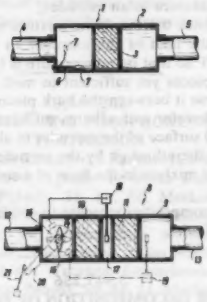
Karlheinz Lange, Stuttgart, Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Stuttgart, Germany

Filed Apr. 26, 1974, Ser. No. 464,984

Claims priority, application Germany, Apr. 28, 1973, 2321578

Int. Cl.² F01N *3/15;* **B01J** *8/00, 8/02, 8/04*

U.S. Cl. 23—288 F **24 Claims**



1. A catalytic exhaust gas purification device for internal combustion engines which includes a housing means having at least one inlet channel means and one discharge channel means and accommodating a first catalyst means, further comprising a baffle means including a baffle element and means for moving said baffle element, in dependence on an increase in the temperature of the catalyst means, between a first position wherein said baffle element lies substantially in a plane which is substantially parallel to the flow direction of said exhaust gases thereby permitting the exhaust gas to flow essentially unimpeded toward the center of the catalyst means and a second position wherein said baffle element lies substantially in a plane substantially perpendicular to the flow direction of said exhaust gas whereby said baffle element deflects the exhaust gas away from the center of the catalyst means causing substantially uniform attack of the catalyst means by the exhaust gas.

3,947,254

HIGH-TEMPERATURE ABRASION-RESISTANT COATING ON A FERROUS METAL SUBSTRATE

Robert H. Kachik, Washington Township, Westmoreland County, and Arthur J. Pignocco, Franklin Township, Westmoreland County, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 332,987, Feb. 15, 1973. This application Sept. 9, 1974, Ser. No. 504,206

Int. Cl.² B32B *15/18*

U.S. Cl. 29—195 **3 Claims**

1. A coke pusher ram shoe comprising a multiplicity of abrasion-resistant metal composites, each composite comprising a metal substrate and a metallurgically bonded hard facing layer consisting essentially of an iron matrix containing from about 45 to about 80 volume percent Fe_2B, said composites fixed together in such manner that the hard facing layer of each forms the wearing surface of said shoe.

3,947,255

METHOD OF EXTRUDING BARK AND OF FORMING A SOLID SYNTHETIC FUEL

William H. Hartman, Rolling Meadows; Raymond E. Mietz, Barrington; John R. Peschke, Prospect Heights, and Donald H. Ruge, Crystal Lake, all of Ill., assignors to American Can Company, Greenwich, Conn.

Filed Jan. 10, 1973, Ser. No. 322,460

Int. Cl. C10l *5/00, 5/14*

U.S. Cl. 44—10 H **40 Claims**

1. A method of forming a solid synthetic fuel comprised of from about 60 to 95% by weight bark, the method which comprises:

drying pieces of bark of an extrudable size to a moisture content of less than 7%,

physically blending pieces of combustible non-noxious non-odor-producing thermoplastic of an extrudable size with said dried pieces of bark to form a bark-thermoplastic mixture of from about 60 to 95% by weight bark and about 5 to 40% by weight thermoplastic,

feeding the mixture to an extruder,

heating the bark thermoplastic mixture in the extruder,

controlling the heat of the extruder to range from about 250°–400°F so that its temperature is insufficient to char the bark pieces yet sufficient to melt the thermoplastic and disperse it between the bark pieces so that it acts as a binder therefor and adheres sufficiently to the interior barrel wall surface of the extruder to allow the mixture to be moved therethrough by the extruder screw,

extruding the mixture in the form of a composite extrudate, and

cooling the composite extrudate to solidify it into the solid synthetic fuel.

3,947,256

METHOD FOR DECOMPOSITION OF POLYMERS INTO FUELS

Yoichi Tsukagoshi, Tokyo; Kyohei Tsuchiya, Ageo; Toshio Inoue, Yachiyo; Toshihiko Ogawa, Matsudo; Hideo Komori, Yokohama; Kyoichi Murakami, Tokyo, and Taizo Ayukawa, Mobara, all of Japan, assignors to Kabushiki Kaisha Niigata Tekrosho, Japan

Filed May 1, 1972, Ser. No. 249,093

Claims priority, application Japan, May 10, 1971, 46-30933; May 10, 1971, 46-30934; May 26, 1971, 46-36103; Aug. 18, 1971, 46-63138; Aug. 18, 1971, 46-63140

Int. Cl.² C10L *1/00, 1/04*

U.S. Cl. 44—50 **5 Claims**

1. In a method of treating high polymer wastes without polluting the atmosphere, the steps of feeding solid petrochemical high polymer bodies which are decomposable by fusion along a predetermined path while simultaneously compressing and shearing the bodies until they reach a state of fusion and decompose at least in part into a fluid state and while tightly filling part of said path with said bodies in a manner preventing escape of gas rearwardly along said path past said part thereof, decompressing the thus-treated bodies immediately subsequent to the compression and shearing thereof while being fed along said path, for further enhancing decomposition, and directing the thus-achieved fluid to a location where it is available for further use.

3. In a method as recited in claim 1 and wherein the fluid achieved from decomposition is directed to a location where it is stored so as to be available as a fuel.

3,947,257

BENZOTRIFLUORIDE FUEL ADDITIVE FOR INTERNAL COMBUSTION ENGINES

Robert Smith-Johannsen, Portola Valley, and Wendell William Moyer, Jr., Atherton, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Apr. 17, 1974, Ser. No. 461,528

Int. Cl.² C10L *1/20*

U.S. Cl. 44—79 **4 Claims**

1. A fuel composition for use in an internal combustion engine which comprises in major proportions gasoline and in sufficient concentration to improve engine performance an aryl fluoroalkane wherein the aryl fluoroalkane is a substituted or unsubstituted benzotrifluoride.

3,947,258

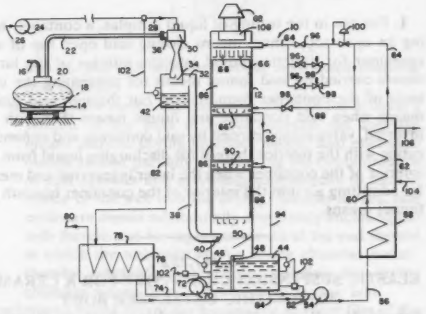
VAPOR STRIPPING AND RECOVERY METHOD AND APPARATUS

Robert W. Decker, Hopewell, N.J., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed May 25, 1972, Ser. No. 256,725

Int. Cl.² B01D *47/00*

U.S. Cl. 55—88 **31 Claims**



1. A method of stripping and recovering vapors from an air-vapor mixture generated by a vaporous, volatile liquid which is exposed to the air, comprising the steps of:

stripping a vaporous, volatile liquid of at least some of its vapors; and

contacting the mixture with a stream of the stripped, volatile liquid, to cause the mixture to give up vapors to the stripped, volatile liquid; wherein

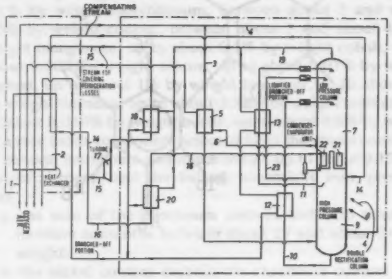
said liquid stripping step comprises vaporizing at least a portion of said liquid and extracting said vaporized portion;

said vaporizing step comprises boiling said liquid to cause vaporization of said portion; further including the step of condensing the vaporized portion; and wherein said condensing step comprises pressurizing said vaporized portion to cause said portion to condense.

3,947,259
THERMODYNAMICALLY IMPROVED SYSTEM FOR PRODUCING GASEOUS OXYGEN AND GASEOUS NITROGEN

Klaus Frischbier, Munich, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed July 10, 1974, Ser. No. 487,130
Claims priority, application Germany, July 10, 1973, 2335096
Int. Cl.² F25J 5/00
U.S. Cl. 62—13 17 Claims



1. In a process for producing gaseous oxygen and gaseous nitrogen by the low-temperature rectification of air in a double rectification column having a low-pressure section and a high-pressure section, comprising warming a cold gaseous process stream having a temperature in the range of liquid air in a reversible heat exchanger zone with entering gaseous air to compensate for cold values required for the condensation and removal of CO_2 and H_2O from the air, and thereupon engine-expanding resultant warmed process stream,

the improvement comprising branching a portion from the resultant warmed process stream prior to engine expansion of said resultant warmed process stream, liquefying said portion substantially completely in a condenser-evaporator unit of the double rectifying column, subcooling resultant liquefied portion to below its liquefaction temperature, and expanding resultant subcooled liquefied portion into the low-pressure section of the double rectification column.

3,947,260
METHOD OF SEALING AND SPACING GLASS SUBSTRATES OF GASEOUS DISCHARGE DISPLAY PANELS USED AT HIGH ALTITUDES

Charles W. Salisbury, Risingsun, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jan. 2, 1975, Ser. No. 537,896
Int. Cl.² C03B 23/24
U.S. Cl. 65—42 11 Claims

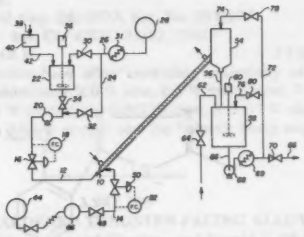
1. A method of sealing the two glass substrates of a gaseous discharge display panel while simultaneously maintaining a uniform gas chamber gap therebetween and strengthening the panel for use at high altitudes which comprise the steps of:

a. inserting in the center of the viewing area between electrode lines on one of the glass substrates glass rods which soften at or below the softening temperature of the periphery solder glass
b. adhering said center glass rods to the substrate by heating
c. applying solder glass with a softening temperature not less than that of said center glass rods to the periphery of the panel
d. inserting outside the viewing area but adjacent the periphery solder glass of said substrate stop gap glass rods with a softening temperature higher than either the center glass rods or the periphery solder glass
e. placing another glass substrate over the first substrate and
f. subjecting the entire assembly to a heat sealing cycle.

3,947,261
PRODUCTION OF AMMONIUM POLYPHOSPHATE SOLUTIONS

Ernest W. Sale; Thomas A. Edwards, and John W. Hodges, all of Lakeland, Fla., assignors to Agrico Chemical Company, Tulsa, Okla.

Filed Jan. 4, 1974, Ser. No. 430,694
Int. Cl.² C05B 7/00
U.S. Cl. 71—34 5 Claims



4. In a process of producing ammonium polyphosphate which includes passing superphosphoric acid axially through a tubular reactor zone while introducing ammonia into said superphosphoric acid which results in an exothermic reaction whereby an ammonium polyphosphate melt is formed, the improvement comprising:

cooling the walls of said tubular reaction zone sufficiently to solidify a layer of molten ammonium polyphosphate melt thereon.

3,947,262
METHOD OF PRODUCING PHOSPHORUS-CONTAINING FERTILIZERS

Nikolai Mikhailovich Baklanov, 3 Parkovaya ulitsa, 48, korpus 2, kv. 54, Moscow; Ljubov Pavlovna Buslakova, Voskresensk, ulitsa Pobedy, 21, kv. 55, Moskovskaya oblast; Raisa Mikhailovna Nekorystnova, Voskresensk, ulitsa Mendeleeva, 14, kv. 64, Moskovskaya oblast; Anatoly Artemievich Novikov, Voskresensk, ulitsa Meditsinskaya, 18, Moskovskaya oblast; Tatyana Grigorievna Repenkova, Voskresensk, ulitsa Pobedy, 20, kv. 11, Moskovskaya oblast; Ivan Ivanovich Rumyantsev, 4 ulitsa 8 Marta, 4, korpus 2, kv. 135; Galina Alexandrovna Sapogova, Leningradsky prospekt, 57, kv. 110a, both of Moscow; Nikolai Pavlovich Solodovnik, Voskresensk, ulitsa Pobedy 20, kv. 5, Moskovskaya oblast, and Viktor Mironovich Fridman, Karetny ryad, 5/10, kv. 180, Moscow, all of U.S.S.R.

Filed July 27, 1973, Ser. No. 383,457
Int. Cl.² C05B 11/04, 11/08; C01B 25/16
U.S. Cl. 71—37 1 Claim

1. A method of producing phosphorus-containing fertilizers, consisting in that the phosphate raw stock is treated with a mineral acid selected from the group, consisting of phosphoric acid, sulphuric acid and a mixture of both to obtain a suspension of the phosphorus-containing raw stock, said suspension being exposed to the effect of acoustic vibrations at a frequency of from 500 to 20,000 Hz and a sound energy density of from 0.5 to 5 W/cm², whereafter the end product is isolated.

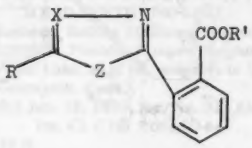
3,947,263

PLANT GROWTH REGULANTS

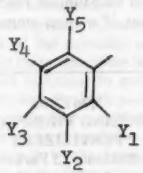
Walter G. Brouwer, Guelph; Edwin J. MacPherson, Elmira, both of Canada; Ronald B. Ames, Naugatuck, Conn.; Robert W. Neidermyer, and Charles E. Crittendon, both of Cheshire, Conn., assignors to Uniroyal, Inc., New York, N.Y. and Uniroyal Ltd., Montreal, Canada

Filed July 29, 1974, Ser. No. 492,376
Int. Cl.[2] A01N *5/00*
U.S. Cl. 71—76 **17 Claims**

1. A method of retarding the growth of plants comprising applying to plants, in a non-herbicidal amount effective to retard the growth of the plants, a chemical which is a 2-(1,3,4-oxadiazol-2-yl) [, a 2-(2-oxazolyl) or a 2-(1,3,4-thiadiazol-2-yl)] benzoic acid, salt, or ester of the formula



where X is nitrogen [or C-R''], Z is oxygen [or sulfur when X is nitrogen, Z is oxygen when X is C-R''], R is the group



where the Y's are the same or different and are selected from the group consisting of hydrogen, halogen, nitro, lower alkyl and lower alkoxy, R' is selected from the group consisting of hydrogen, a moiety which forms an alkali metal, a polyvalent metal, an ammonium, alkyl- or hydroxyalkylammonium salt with said acid, and a moiety which forms an aliphatic or cycloaliphatic hydrocarbyl or epoxy lower alkyl ester with said acid wherein the alkyl, hydroxyalkyl, aliphatic or cycloaliphatic moieties may contain up to 12 carbon atoms.

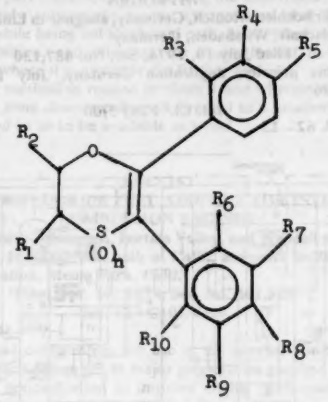
3,947,264

SUBSTITUTED 2,3-DIHYDRO-1,4-OXATHIIN PLANT GROWTH STUNTING AGENTS

Bruce A. Graham; Michael A. Puttock, both of Guelph; Ethel E. Felauer, Arkell, all of Canada, and Robert W. Neidermyer, Cheshire, Conn., assignors to Uniroyal, Inc., New York, N.Y. and Uniroyal Ltd., Montreal, Canada

Filed Apr. 9, 1974, Ser. No. 459,442
Int. Cl.[2] A01N *5/00*
U.S. Cl. 71—76 **6 Claims**

1. A method of retarding the growth of plants comprising applying to a locus at which it is desired to retard the growth of plants, in an amount effective to retard the growth of plants, a substituted 2,3-dihydro-1,4-oxathiin chemical of the formula



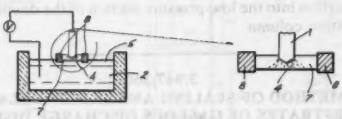
wherein the R's are the same or different and are selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, chlorine, bromine, fluorine, amino, lower alkylthio and lower acyloxy and *n* is zero, 1 or 2.

3,947,265

PROCESS OF ADDING ALLOY INGREDIENTS TO MOLTEN METAL

Matthew M. Guzowski, Wallingford, Conn.; E. Dennis Bishop, Pittsburgh, Pa., and William C. Setzer, Hamden, Conn., assignors to Swiss Aluminium Limited, Chippis, Switzerland

Filed Oct. 23, 1973, Ser. No. 408,500
Int. Cl.[2] C22B *4/06*; **C22C** *1/00*
U.S. Cl. 75—10 R **11 Claims**



1. A process for adding alloying material to molten metal comprising the steps of:

A. providing the molten metal having an upper surface within a container;

B. providing the alloying material in the form of an elongated element having a free end;

C. placing the said alloying element end in close proximity to, but spaced from, the surface of the molten metal;

D. establishing an electrical potential of about 15 to 30 volts between the molten metal surface and the alloying element, to form an electric arc between the alloying element and the molten metal at a current density in excess of 100,000 amperes per square inch of cross-sectional area of the alloying element; and

E. advancing the said alloying element toward the said surface to maintain the said arc, whereby, the alloying element is converted to a spray of molten particles having a size less than about 100 microns which are driven through the arc into the molten metal and uniformly distributed therein.

3,947,266

CORROSION-RESISTANT ALLOYS

John H. Culling, Kirkwood, Mo., assignor to Carondelet Foundry Company, St. Louis, Mo.

Filed May 17, 1974, Ser. No. 470,795
Int. Cl.² C22C *30/00*
U.S. Cl. 75—122 5 Claims

1. An air-meltable, castable, workable alloy resistant to corrosion in sulfuric acid over a wide range of acid strengths consisting essentially of between about 28.59 and about 36.72% by weight nickel, between about 26.33 and about 30.15% by weight chromium, between about 3 and about 4.1% by weight molybdenum, between about 3 and about 4.5% by weight copper, between about 3 and about 4% by weight manganese, up to about 0.5% by weight cobalt, up to about 0.60% by weight silicon, up to about 0.07% by weight carbon, up to about 1% by weight tantalum, up to about 1% by weight titanium, up to about 2.38% by weight niobium, up to about 0.010% by weight boron, up to about 0.6% by weight of a rare earth component selected from the group consisting of cerium, lanthanum and misch metal, up to about 0.15% by weight nitrogen, and the balance essentially iron, provided that:

a. the sum of the chromium content and 0.56 times the niobium content is between about 27 and about 31% by weight;
b. the nickel content exceeds the chromium content by at least about 1.5%;
c. the nickel content exceeds the sum of the chromium content and 0.56 times the niobium content by at least about 1.4%; and
d. where the carbon content exceeds 0.04% by weight, it is less than the sum of five times the titanium content and 10 times the niobium plus tantalum content.

3,947,267

PROCESS FOR MAKING STAINLESS STEEL

John C. d'Entremont, Middletown, and Charles R. Taylor, Trenton, both of Ohio, assignors to Armco Steel Corporation, Middletown, Ohio

Continuation-in-part of Ser. No. 381,687, July 23, 1973, abandoned. This application June 19, 1974, Ser. No. 480,846
Int. Cl.² C21C *5/52*
U.S. Cl. 75—130.5 25 Claims

1. In a process for making molten ferrous alloys containing from about 5.0% to about 30.0% by weight chromium, and up to about 25.0% by weight nickel and comprising the steps of introducing into a first vessel a charge consisting essentially of chrome ore, iron ore and a source of carbon, smelting said charge in said vessel by means of a submerged arc to provide an unrefined liquid ferrous alloy consisting essentially of about 5.0% to 30.0% by weight chromium, at least 2.0% by weight carbon, up to about 2.0% by weight silicon, the balance being essentially iron, transferring said liquid ferrous alloy from said first vessel to a second vessel, top blowing pure gaseous oxygen against said liquid alloy in said second vessel to partially reduce said silicon and carbon, continuing said oxygen blow until said carbon has been reduced to less than about 0.20% by weight, immediately thereafter finishing said refining by introducing gaseous oxygen and an inert gas or nitrogen into said liquid alloy below the surface thereof to bring the carbon content to the desired final level and making finishing additions and temperature adjustments to meet the desired final chemistry and tap temperature, the improvement comprising in combination therewith the steps of pre-reducing said chrome and iron ores prior to charging them into said first vessel and agglomerating said chrome and iron ores prior to charging them into said first vessel, said chrome ores being low grade chrome ores having a chrome to iron ratio of 3.5 and less and being usable for up to 100% of the chrome requirements, whereby said process may be practiced using one or two typical first submerged arc vessels for each typical second vessel.

3,947,268

MAGNESIUM-BASE ALLOY

Vera Viktorovna Tikhonova, Trubnikovsky pereulok, 19, kv. 11; Alexandr Ivanovich Markov, ulitsa Veernaya, 34, kv. 99; Marina Andreevna Gerasimova, Alleya Zhemchugovoi, 3, korpus 3, kv. 71; Galina Ivanovna Zhukova, ulitsa Krasny Kazanets, 19, korpus 1, kv. 277; Morits Borisovich Altman, Mironovskaya ulitsa, 9, kv. 100; Margarita Alexandrovna Timonova, 13 Parkovaya ulitsa, 31, korpus 1, kv. 32; Tatyana Ivanovna Ershova, ulitsa Shvernika 18, korpus 2, kv. 74, all of Moscow; Boris Trofimovich Krysin, Parkovaya ulitsa, 7, kv. 120, Balashikha Moskovskoi oblasti; Georgy Gerasimovich Kitari-Oglu, Planetnaya ulitsa, 18, kv. 23, Moscow; Galina Ivanovna Morozova, B. Cherkizovskaya ulitsa 10, korpus 10, kv. 9, Moscow, and Nikolai Fedorovich Lashko, ulitsa Kosinskaya, 18, korpus 3, kv. 272, Moscow, all of U.S.S.R.

Filed Aug. 24, 1973, Ser. No. 391,274
Int. Cl.² C22C *23/02, 23/04*
U.S. Cl. 75—168 B 3 Claims

1. A magnesium-base alloy consisting essentially of, by weight: 7.7 % aluminum, 2.0 % zinc, 0.5 % manganese, 0.005 % titanium 0.3 % zirconium, 0.007 % iron, 0.0007 % nickel, 0.03 % silicon, 0.02 % copper and the balance being magnesium.

3,947,269

BORON-HARDENED TUNGSTEN FACING ALLOY

Herbert F. Prasse, Town and Country, and Harold E. McCormick, Ballwin, both of Mo., assignors to TRW Inc., Cleveland, Ohio

Division of Ser. No. 1,187, Jan. 7, 1970, Pat. No. 3,725,017. This application Aug. 24, 1972, Ser. No. 283,330
Int. Cl.² C22C *19/00*
U.S. Cl. 75—170 8 Claims

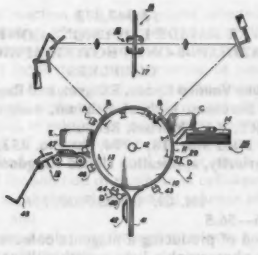
1. A plasma jet sprayed metal alloy derived from a powder mixture containing nickel, chromium, boron and tungsten carbide, said alloy as a result of the plasma spraying evidencing a tungsten phase having a Vickers hardness in excess of 2,000 and a nickel chromium matrix having a Vickers hardness of at least 800, the volume fraction of said tungsten phase being at least 35%, said tungsten phase being interstitially hardened by the presence of said boron, and said alloy being substantially free from tungsten carbide.

3,947,270

REPRODUCING APPARATUS AND PROCESS FOR DUPLEX IMAGING IN A SINGLE PASS

Arthur J. North, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 1, 1973, Ser. No. 411,996
Int. Cl.² G03G *13/14*
U.S. Cl. 96—1.4 15 Claims



11. A process for forming an image on a first and an opposing side of a copy sheet comprising:

providing a moving photosensitive surface;
forming a first image on a first portion of said photosensitive surface, and a second image on a second portion of said photosensitive surface; and
transferring sequentially said first image and said second image to a first and an opposing side respectively of said copy sheet, said transferring step including the steps of pivotably securing said copy sheet at said photosensitive surface and pivoting said sheet about said surface following transfer of said first image to said first side of said sheet.

3,947,271

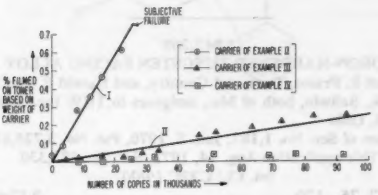
ELECTROSTATIC IMAGING METHOD USING A POLYTETRAFLUOROETHYLENE COATED CARRIER PARTICLE

Howard E. Munzel, and Carl A. Queener, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 226,015, Feb. 14, 1972, abandoned. This application May 22, 1974, Ser. No. 472,335

Int. Cl.² G03G *13/00, 9/00*

U.S. Cl. 96—1 SD **1 Claim**


SUBJECTIVE FAILURE
% FILMED ON TONER BASED ON WEIGHT OF CARRIER
CARRIER OF EXAMPLE II
CARRIER OF EXAMPLE III
CARRIER OF EXAMPLE IV
NUMBER OF COPIES IN THOUSANDS

1. A method of forming an electrostatic image, comprising the steps of:
forming a latent electrostatic image by imagewise exposing a charged electrostatic imaging member and,
contacting said latent image with a developer mixture comprising a toner and a plurality of carrier beads each said bead consisting essentially of:
a ferromagnetic, electrically conductive core having a size of from 50 to 600 microns;
a first coating of primer material in a uniform thickness of from about 0.1 to 5 microns, said first coating comprising polytetrafluoroethylene and a mixture of chromic and phosphoric acids for reacting with said core to improve adhesion;
a second coating in a uniform thickness of from about 0.1 to about 10 microns of a continuous phase of sintered, coalesced patricles of polytetrafluoroethylene; and,
the combined thickness of both said first and second coatings being from about 0.2 to aobut 10 microns.

3,947,272

SILVER HALIDE EMULSIONS CONTAINING 2-PYRAZOLON-5-ONE PHOTOGRAPHIC COLOUR COUPLERS

Hector Alfons Vanden Eynde, Edegem, and Raphael Karel Van Poucke, Berchem, both of Belgium, assignors to AGFA-GEVAERT, N.V., Mortsel, Belgium

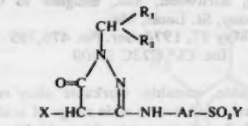
Filed Mar. 18, 1974, Ser. No. 452,326

Claims priority, application United Kingdom, Apr. 6, 1973, 16627/73

Int. Cl.² G03C *7/00, 1/40*

U.S. Cl. 96—56.5 **13 Claims**

1. Method of producing a magenta coloured photographic image in a photographic light-sensitive silver halide material which comprises exposing the material and developing it with an aromatic primary amino colour developing agent in the presence of a 2-pyrazolin-5-one colour coupler corresponding to the formula :



wherein :
R_1 represents hydrogen, alkyl or aryl,
R_2 represents a fluoroalkyl group $X(CF_2)_n-$ wherein X is hydrogen or fluorine and n is 1 to 10, an α-cyanoalkyl group, or a phenyl group,
X represents hydrogen or a substituent that exhibits 2-equivalent character,
Ar represents a phenylene group, and
Y represents an alkyl group, an aryl group, a monoalkylamino group, a monoarylamino group, a dialkylamino group or an alkylarylamino group.

3,947,273

DEVELOPMENT MODIFIERS FOR SILVER HALIDE EMULSIONS

Robert Joseph Pollet, Vremde; Herman Adelbert Philippaerts, Edegem; Francis Jeanne Seis, Kontich, and Francois Leon Schelfaut, St. Niklaas, all of Belgium, assignors to AGFA-GEVAERT, N.V., Mortsel, Belgium

Filed Apr. 29, 1974, Ser. No. 465,370

Claims priority, application United Kingdom, June 1, 1973, 26250/73

Int. Cl.² G03C *5/30, 1/06, 1/72*

U.S. Cl. 96—66.3 **24 Claims**

1. A process for developing a photographic element containing a support and at least one image-wise exposed silver halide emulsion layer in a silver halide developer wherein a polyoxyethylene compound corresponding to the formula:

$$RO(CH_2CH_2O)_n(CO)_mA$$

wherein:
R represents hydrogen, C_1–C_5 alkyl or $(-CO)_m-A$,
n is an integer of at least 4,
m is 0 or 1, and
A represents, when m is 0, sulphoalkyl, carboxyalkyl, or sulphoalkoxycarbonylalkyl, carbonylalkyl, and when m is 1, carboxyalkyl, sulphoalkoxycarbonylalkyl, carboxyalkenyl, sulphoalkoxycarbonylalkenyl, carboxyphenyl, sulphoalkoxycarbonylphenyl or sulphophenyl,
the aliphatic hydrocarbon groups having at most 4C-atoms and the carboxyl and sulpho groups being in acid or salt form is present at the time of development in said element or in said developer.

3,947,274

SILVER HALIDE PHOTOGRAPHIC MATERIAL CONTAINING AN ISOUREA DERIVATIVE AS ANTIFOGGANT

Akikazu Mikawa; Ikutaro Horie; Keiichi Adachi, and Hisashi Shiraishi, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

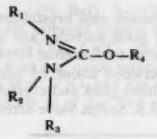
Filed May 14, 1974, Ser. No. 469,924

Claims priority, application Japan, May 15, 1973, 48-53905

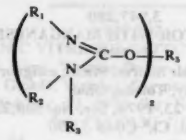
Int. Cl.² G03C *1/34*

U.S. Cl. 96—107 **11 Claims**

1. A photographic light-sensitive material comprising a support having thereon at least one silver halide photographic emulsion layer, with at least one of the layers of said photographic light-sensitive material containing a compound represented by the following general formula (I) or (II)



(I)



(II)

wherein R_1, R_2, and R_3 each represents a hydrogen atom, an alkyl group, an aryl group or a 6-membered heterocyclic ring group containing 1 nitrogen atom, and R_2 and R_3 can combine to form an alkylene group so that a 5-membered ring may be formed; R_4 represents those groups other than a hydrogen atom as described for R_1, R_2 and R_3; and R_5 represents an alkylene group or a polyoxyalkylene group having at least 4 carbon atoms or the organic acid salt or mineral acid salt thereof; said compound being employed in an amount from about 0.01g to 50g per 1 mol of silver halide.

3,947,275

SPECTRALLY SENSITIZED SILVER HALIDE PHOTOGRAPHIC EMULSION

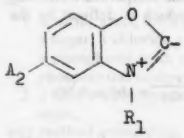
Keisuke Shiba; Akira Sato, and Akira Ogawa, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

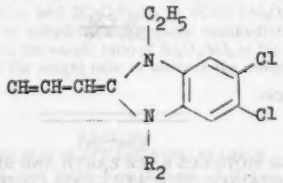
Continuation-in-part of Ser. No. 139,331, May 3, 1971, abandoned. This application Nov. 21, 1973, Ser. No. 417,841

Int. Cl.² G03C 1/14

U.S. Cl. 96—124 **17 Claims**

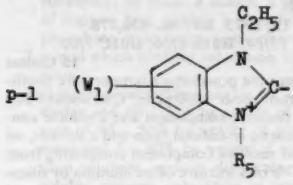
1. A sensitized gelatino-silver halide emulsion containing a supersensitizing combination of at least one sensitizing dye of the general formula I(*a*):

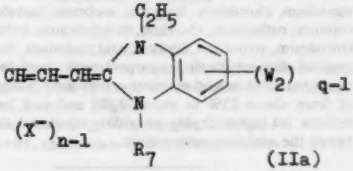




(Ia)

wherein A_2 is a member selected from the group consisting of a phenyl group, an alkoxycarbonyl group in which the alkyl moiety thereof has up to 3 carbon atoms, an alkyl group having up to 3 carbon atoms, an alkoxy group, a hydroxy group, a trifluoromethyl group, and a halogen atom; R_1 and R_2 are each a member selected from the group consisting of an alkyl group having up to 6 carbon atoms and a substituted alkyl group having a sulfogroup thereon in which the alkyl moiety thereof has up to 6 carbon atoms, at least one of R_1 and R_2 being a substituted alkyl group having a sulfo group thereon; and at least one sensitizing dye of the general formula II(*a*):





(IIa)

wherein W_1 and W_2, which may be the same or different, are each a member selected from the group consisting of a halogen atom, an alkoxycarbonyl group, a trifluoromethyl group and a cyano group; *p* and *q* are 1,2 or 3; R_5 and R_7 are each a member selected form the group consisting of an alkyl group having up to 6 carbon atoms and having a member selected from the group consisting of a sulfo group and a carboxy group thereon; X is an acid anion and *n* is an integer of from 1 to 2, n being 1 when an intramolecular salt is formed.

3,947,276

METHOD FOR THE PRODUCTION OF CELLULOSE-BASED FIBRES AND POLYNOSIC FIBRES HAVING A HIGH RESISTANCE TO COMBUSTION, AND FIBRES AND TEXTILE ARTICLES OBTAINED THEREBY

Francesco Siclari, Barlassina, and Pietro Paolo Rossi, Garlasco, both of Italy, assignors to Snia Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A., Milan, Italy

Filed Oct. 24, 1973, Ser. No. 409,070

Claims priority, application Italy, Oct. 26, 1972, 30978/72

Int. Cl.² C08L 1/24; C09D 5/18

U.S. Cl. 106—15 FP **13 Claims**

1. A method for the production of fibres and yarns consisting prevailingly of cellulosic compounds having high resistance to the propagation and maintenance of combustion comprising

adding to a spinnable cellulosic solution of xanthate of cellulose,

the product of reaction with a compound selected from the group consisting of ammonia and amines of tetrakis-hydroxymethylphosphonium with a monomeric aminoacid selected from the group consisting of aminoacetic, sulphanylic, p-amino-benzoic, 12-amino-dodecanoic, 6-aminohexanoic, alpha-aminoisovaleric, and alpha-amino-propionic acid, in solution in an alkaline aqueous solvent,

the compound of phosphorus in the last-named solution being enriched with NaOH until its free alkali content is near that of the solution of xanthate of cellulose to which it is added, and being soluble in said solution of xanthate of cellulose, and

spinning the mixed solutions through nozzles in a regenerating and coagulating bath,

said product in solution being added to said spinnable cellulose solution by feeding it in metered amounts upstream of the spinning nozzles.

3,947,277
DUPLEX RESISTOR INKS

Robert D. Carnahan, Barrington, and Karl J. Youtsey, Chicago, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Dec. 19, 1973, Ser. No. 426,278
Int. Cl.² C09D *11/14*; H01B *1/06*; H01C *7/00*
U.S. Cl. 106—26 **15 Claims**

1. An electrical resistor ink possessing a temperature coefficient of resistance of from about +500 ppm/° C to about −500 ppm/° C comprising a resistive component and a vehicle containing a binder of synthetic or natural resin and a solvent, oil or mixture thereof, said resistive component comprising from about 10% to about 97% of a mixture of an alumina or silica-alumina base having a mono-layer of a carbonaceous pyropolymer on the surface thereof and an oxide of a transition metal selected from the group consisting of titanium, zirconium, vanadium, chromium, tungsten, niobium, tantalum, rhenium, osmium, ruthenium, rhodium, molybdenum, iridium, calcium, lanthanum, strontium, barium, and cadmium, the weight percent of semiconducting pyropolymeric inorganic refractory oxide material in said resistive component being in the range of from about 25% to about 90%, and said vehicle of said resistor ink upon drying providing electrical continuity between the resistive components.

3,947,278
DUPLEX RESISTOR INKS

Karl J. Youtsey, Chicago, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Dec. 19, 1973, Ser. No. 426,279
Int. Cl.² C09D *11/14*; H01B *1/02, 1/06*; H01C *7/00*
U.S. Cl. 106—26 **11 Claims**

1. An electrical resistor ink possessing a temperature coefficient of resistance of from about +500 ppm/°C to about −500 ppm/°C comprising a resistive component and a vehicle containing a binder of synthetic or natural resin and a solvent, oil or mixtures thereof, said resistive component comprising from about 10% to about 97% of a mixture of carbon black and an alumina or silica-alumina base having a mono-layer of a carbonaceous pyropolymer on the surface thereof, the weight percent of semiconducting pyropolymeric inorganic refractory oxide material in said resistive component being in the range of from about 25% to about 75%, and said vehicle of said resistor ink upon drying providing electrical continuity between the resistive components.

3,947,279
THERMALLY CRYSTALLIZABLE GLASSES POSSESSING PRECISION CONTROLLED CRYSTALLIZATION AND FLOW PROPERTIES AND PROCESS OF PRODUCING SAME

Carl J. Hudecek, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

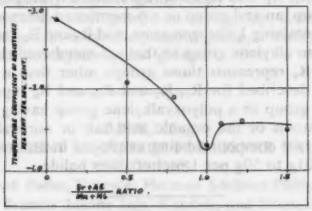
Continuation of Ser. No. 211,656, Dec. 23, 1971, abandoned, which is a continuation of Ser. No. 814,156, April 7, 1969, abandoned. This application Mar. 29, 1974, Ser. No. 456,562
Int. Cl.² C03C *3/22, 3/12*
U.S. Cl. 106—39.6 **6 Claims**

1. A thermally crystallizable glass composition consisting essentially of a uniform blend of finely comminuted, crystallized and uncrystallized particles of thermally crystallizable glass, said crystallized particles and said uncrystallized particles being present in said glass in a relative ratio of between 100 and 225 parts by weight of crystallized glass particles for each million parts by weight of uncrystallized glass particles, said glass composition being for use in blending with additional uncrystallized glass in particulate form in the ratio of 1 to 10 parts for each million parts by weight of additional uncrystallized glass in order to reduce the crystallization and flow rate of the uncrystallized glass in a controlled manner within predictable and predetermined limits whereby the resulting glass has precisely predictable thermal crystallization and flow rates, and wherein said crystallized glass particles and said uncrystallized glass particles are of a particle size such that all of the particles are less than 100 mesh screen size, and further wherein between about 65 and 78 percent by weight of the uncrystallized glass and crystallized glass particles are less than 325 U.S. Series Sieve screen size.

3,947,280
SEMI-CONDUCTOR WITH MANGANESE OXIDE MATRIX

Joseph Nemeth, St. Clair Shores, Mich., assignor to Champion Spark Plug Company, Toledo, Ohio

Filed Sept. 23, 1974, Ser. No. 508,237
Int. Cl.² C04B *33/00*
U.S. Cl. 106—45 **1 Claim**



1. An electrical semi-conductor suppressor element, said element consisting essentially of alumina, manganese oxide and strontium oxide as a modifying strontium compound and which also may contain nickel oxide, wherein the strontium-/aluminum atom ratio has a value of about 0.5:1 to 0.95:1, wherein manganese constitutes from 50 percent to 100 percent based upon the total number of atoms of manganese and nickel, and wherein the proportions of alumina, manganese, nickel and strontium are such that the numerical value of the atom ratio

$$\frac{Sr + Al}{Mn + Ni}$$

is from about 0.1 to 1.5, and wherein the temperature coefficient of resistance of the suppressor which is defined by the expression

$$n = 2.303 \log_{10} \frac{(R_2)}{(R_1)} \times \frac{(1)}{(T_2 - T_1)} \times 100 \text{ in } \%/^{\circ}C$$

is between about −2.8%/°C and −1.3% depending upon the value of the

$$\frac{Sr + Al}{Mn + Ni}$$

atom ratio.

3,947,281
HIGH MODULUS RARE EARTH AND BERYLLIUM CONTAINING SILICATE GLASS COMPOSITIONS

James F. Bacon, Manchester, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 874,675, Nov. 6, 1969, abandoned. This application June 2, 1972, Ser. No. 259,056
Int. Cl.² C03C *3/04, 13/00*
U.S. Cl. 106—52 **12 Claims**

1. A glass composition having a Young's modulus of at least 16 million psi and a specific modulus of at least 110 million inches consisting essentially of, by weight, approximately:

20–43% SiO_2, 4–10% BeO, 8–21% Al_2O_3, 27–58% of at least one oxide selected from a first group consisting of Y_2O_3, La_2O_3, Nd_2O_3, Ce_2O_3 and mixtures thereof and 3–12% of at least one oxide selected from a second group consisting of MgO, ZrO_2 and ZnO, the molar ratio of BeO to the total conte nt of said first group oxides being from 1.0 to 3.0.

3,947,282
INORGANIC VITREOUS DETECTOR MATERIAL

Hans-Herbert Kaes, Wetzlar-Dorlar, Germany, assignor to Ernst Leitz GmbH, Wetzlar, Germany

Filed Dec. 13, 1973, Ser. No. 424,618
Int. Cl.² C03C *3/16*
U.S. Cl. 106—54 **4 Claims**

1. An inorganic vitreous detector material having the properties of excellent energy resolution for impinging heavy ions and fission products, a high dependence of specific hole diameter with respect to impinging particle energy and as being substantially insensitive to background electrons and gamma-rays, said material consisting essentially of:

a. silicon dioxide SiO_2 and boron trioxide B_2O_3 in an amount not exceeding about 10% by weight; and

b. the balance, a three-component basic system consisting essentially of metaphosphoric acid, aluminum metaphosphate and zinc oxide within the following concentration limits:

about 20 to 60% by weight of metaphosphoric acid HPO_3,

about 30 to 80% by weight of aluminum metaphosphate $Al(PO_3)_3$, and

about 2 to 30% by weight of zinc oxide ZnO.

3,947,283
METHOD FOR SOLIDIFYING SLUDGE

Hiroshi Uchikawa, Funabashi, and Masao Shimoda, Tokyo, both of Japan, assignors to Onoda Cement Company, Limited, Yamaguchi, Japan

Filed July 24, 1974, Ser. No. 491,347
Claims priority, application Japan, Aug. 16, 1973, 48-91312
Int. Cl.² C04B *7/02, 7/35*
U.S. Cl. 106—89 **3 Claims**

1. A method for solidifying a sludge having a high water/solid ratio and containing a substance having a harmful influence upon the setting of portland cement, where said sludge is:

1. a sand, a silt, a clay or colloidal particles which contain a sugar, a chloride or a hydroxide of copper, lead or zinc; a phosphoric acid; an inorganic phosphate or an organic phosphorous compound or

2. a mud which contains substances discharged from a metal mine,

said method comprising mixing the sludge and rapid hardening cement containing clinker consisting of 5 – 60% by weight of $11CaO{\cdot}7Al_2O_3{\cdot}CaX_2$; and $3CaO{\cdot}SiO_2$ solid solution, $2CaO{\cdot}SiO_2$ solid solution and $2CaO{\cdot}Fe_2O_3$ — $6CaO{\cdot}2Al_2O_3{\cdot}Fe_2O_3$; and anhydrite or anhydrite and gypsum semihydrate in an amount such that the weight ratio of Al_2O_3/SO_3 in the cement is 0.4 – 1.8 and the weight ratio of water in the sludge to the cement is 0.8 – 2.5.

3,947,284
METHOD FOR SOLIDIFYING SLUDGE

Kyoichi Kitsugi, and Seizo Kozeki, both of Tokyo, Japan, assignors to Onoda Cement Company, Limited, Yamaguchi, Japan

Filed Sept. 3, 1974, Ser. No. 502,533
Claims priority, application Japan, Sept. 21, 1973, 48-105969
Int. Cl.² C04B *7/02, 7/35*
U.S. Cl. 106—89 **4 Claims**

1. A method for solidifying a sludge having a high water/solid ratio and containing a substance having a harmful influence upon the setting of portland cement, where said sludge is:

1. a sand, a silt, a clay or colloidal particles which contains a sugar; a cracked petroleum substance; a fat; a humic substance; an oxide, a sulfide, a chloride or a hydroxide of copper, lead or zinc; a phosphoric acid; an inorganic phosphate or an organic phosphorous compound, or

2. a mud which contains substances discharged from a metal mine,

said method comprising mixing 90 – 70% by weight of the sludge and 10 – 30% by weight of a mixture which consists of 95 – 50% by weight of a hydraulic portland cement and 5 – 50% by weight of sodium sulphate, potassium sulphate, gypsum dihydrate, gypsum hemihydrate, soluble gypsum anhydride or insoluble gypsum anhydride.

3,947,285
ACCELERATOR

Kenneth Wood Jones, East Leake, and David John Hazeldine, West Bridgford, both of England, assignors to BPB Industries Limited, London, England

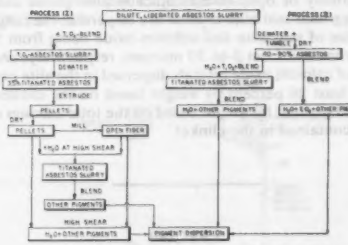
Filed Aug. 20, 1973, Ser. No. 389,763
Claims priority, application United Kingdom, Nov. 7, 1972, 51368/72
Int. Cl.² C04B *11/14, 11/00*
U.S. Cl. 106—111 **9 Claims**

1. A set accelerating agent for use in gypsum plaster comprising finely particulate intimate admixture of gypsum and up to 10% by weight, based on the weight of the gypsum, of a long chain fatty carboxylic acid or salt thereof containing from 12 to 22 carbon atoms.

3,947,286
PIGMENTED ASBESTOS COATING SYSTEMS

John L. Myers, Lewiston, N.Y.; Richard W. Lasher, Palos Verdes Peninsula, and Russell D. James, La Mirada, both of Calif., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 300,193, Oct. 24, 1972, which is a continuation-in-part of Ser. No. 34,796, May 5, 1970, abandoned. This application July 26, 1974, Ser. No. 492,062
Int. Cl.² C09K *3/00*; C08K *3/34, 7/12*
U.S. Cl. 106—286 **13 Claims**



1. A pigment dispersion for a coating composition in which the pigment solids consist essentially of anionic pigmented, liberated, colloidal, high purity chrysotile asbestos fibers having a surface area of about 60–80 meters²/gram, a reflectance of at least 72% and a magnetite content of below 0.8%, an amount of anionic pigment being present sufficient to completely satisfy the cationic charge on said asbestos fibers.

3,947,287
AQUEOUS PIGMENT DISPERSIONS

Horst Belde; Knut Oppenlaender; Ewald Daubach, and Rolf Fikentscher, all of Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Continuation-in-part of Ser. No. 303,624, Nov. 3, 1972, Pat. No. 3,841,888. This application Dec. 12, 1973, Ser. No. 424,175

Claims priority, application Germany, Nov. 15, 1971, 2156603; July 27, 1972, 2236906

Int. Cl.² B01F *17/42*; C09C *3/08*

U.S. Cl. 106—308 Q **7 Claims**

1. An aqueous pigment dispersion which does not flocculate in a cellulose-ether-containing emulsion paint or distemper which contains, with reference to the total weight of (a) + (b) + (c),

a. from 20 to 55% by weight of a finely divided pigment;

b. from 5 to 25% by weight of a water-soluble surfactant or mixture of surfactants obtained by reaction of a hydroxyl compound of the formula: $A(OH)_m$ in which

A is an m-valent aliphatic or cycloaliphatic radical of two to 10 carbon atoms,

OH is primary or secondary hydroxyl; and

m is one of the integers from 2 to 6;

with from 3 to 50 moles of propylene oxide per equivalent of primary and secondary hydroxyl and then with from 2 to 70 moles of ethylene oxide per equivalent of primary and secondary hydroxyl and

c. from 40 to 75% by weight of a mixture of water and a waterretaining agent.

3,947,288
EXPANSIVE CEMENT ADDITIVE AND PROCESS FOR PRODUCING THE SAME

Toshio Kawano; Takaro Mori, both of Kawasaki, and Hachiro Kubota, Tokyo, all of Japan, assignors to Onoda Cement Co., Ltd., Yamaguchi, Japan

Filed June 24, 1974, Ser. No. 482,506

Claims priority, application Japan, June 29, 1973, 48-72804

Int. Cl.² C04B *31/02*

U.S. Cl. 106—314 **8 Claims**

1. An improved expansive cement additive of pulverized clinker, whose clinker consists essentially of alite crystals containing calcium oxide crystals therein, and a phase consisting essentially of optic-microscopically amorphous calcium sulfate in which said alite crystals are dispersed; the ranges of crystal size of said alite and calcium oxide being from 50 to 800 microns and from 5 to 30 microns, respectively, and the content of calcium oxide crystals dispersed in the alite crystals being at least 20 percent by weight based on the clinker and at least 50 percent by weight based on the total calcium oxide crystals contained in the clinker.

3,947,289
MIXED SOLVENTS FOR HIGH AND LOW TEMPERATURE ORGANIC ELECTROLYTE BATTERIES

Arabinda Dey, Needham, and Bernard P. Sullivan, Arlington, both of Mass., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Nov. 23, 1973, Ser. No. 418,526

Int. Cl.² H01M *10/00*

U.S. Cl. 136—6 LN **9 Claims**

1. An electrolyte for use in active metal high potential electrochemical cells comprising an active metal salt dissolved in a non-aqueous solvent system comprising (a) at least 10 volume percent of tetrahydrofuran or N-nitrosodimethylamine or mixtures thereof; and (b) propylene carbonate, gamma-butyrolactone, 1,3-dioxolane, dimethoxyethane, bis (2-

ethoxy) ethyl ether, bis (2-methoxy) ethoxy-ethyl ether and mixtures thereof.

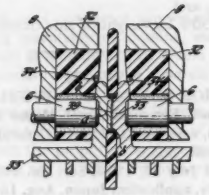
3,947,290
PROCESS AND APPARATUS FOR MAKING INTERCELL CONNECTORS BY AN EXTRUSION-FUSION TECHNIQUE

Robert C. Matter, Anderson, and Larry D. Spangler, Yorktown, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 23, 1973, Ser. No. 418,590

Int. Cl.² H01M *2/26*

U.S. Cl. 136—134 R **4 Claims**



1. A method of making substantially liquid-tight intercell connections for lead-acid storage batteries of the type having (a) nonconductive partitions dividing the case of the battery into compartments, (b) apertures in the partitions connecting adjacent compartments, (c) cell groups in the compartments, (d) a plate connector strap on each cell group, and (e) upstanding lugs on the connector straps with the lugs facing each other on each side of the apertures, the lugs being thicker than a said partition and having face portions on their face sides adapted to fully engage the immediate surface areas of the partitions around the apertures and joint-forming portions circumscribed by said face portions and adapted by fusion to link one lug to the other through the apertures, said method comprising the steps of:

positioning the cell groups with their associated straps in the compartments so that the lugs of the straps overlay the apertures of the partitions with the face portions adjacent the immediate surface area around the apertures, said lugs being cast from a hypoeutectic lead-antimony alloy containing at least about 2 percent by weight antimony and comprising a major portion of antimony-lean-phase and a minor portion of antimony-rich-phase;

positioning tool means on the back sides of the lugs, the tool means for each lug including a clamp portion, a bore in the clamp portion, a conductive plunger in the bore and means for applying force to said plunger said means including an energy storage device for storing rapidly-expendable potential energy behind said plunger, the bores and plungers for opposing lugs being aligned with a substantial area of their associated aperture;

actuating said tool means to cause the clamp portions to engage the lugs with a sufficient clamping force to seal off the apertures with the face portions of the lugs, the joint-

forming portions being spaced from each other midway through the apertures and with the partitions defining apertures which are substantially free of lug material;

while still clamped and with said force applying means, causing the plungers to sink into the back sides of the lugs to a depth less than their thickness and short of the mouths of the apertures to extrude said lead alloy from the joint-forming portions of the lugs into the apertures to bridge the space therein and make a contact area between the lug extrusions approximately midway through the apertures, said contact area comprising about 15 to 75 percent of the area of the aperture as viewed in a direction normal to the partition, and storing sufficient rapidly-expendable potential energy in said energy storage device behind said plungers to cause quick and forceful flow of said lug extrusions in immediate response to a lessening of the lug extrusions' resistance to flow;

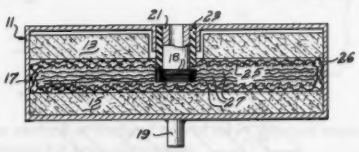
while still clamped and with said energy stored behind said plungers, passing and, gradually increasing the flow of, electrical current through the plungers and lug extrusions to effect staged physical transformations in the lug extrusions including first softening the lug extrusions prior to fusion, then melting the antimony-rich-phase of the alloy at said contact area and finally melting the antimony-lean-phase of the alloy at the contact area, and releasing said stored energy from said energy storage device when sufficient electrical current has flowed through said extrusions to effect said softening so as to effect a flow of said extrusions in immediate forceful response to said transformations and such that said energy rapidly expends itself as a continuous application of sufficient plunger pressure on the extrusions to cause flow of the melted antimony-rich-phase from near the center of the weld outwardly against the walls of the apertures before any substantial melting of the antimony-lean-phase occurs thereby forming an antimony-rich annulus around an antimony-leaner weld center;

deenergizing the electrical current and allowing the fused lead alloy in the apertures to progressively solidify from the center of the weld zone radially outward toward the aperture walls while continuing to maintain the clamping force and plunger pressure to keep the apertures filled during the solidification; whereby the cell groups are electrically joined by the lugs by liquid-tight, substantially void-free, through-the-partition connections having metallurgically strong antimony-rich annuli and metallurgically weaker antimony-lean centers.

3,947,291
ELECTROCHEMICAL CELL ASSEMBLED IN DISCHARGED STATE

Neng-Ping Yao, Hinsdale, and William J. Walsh, Naperville, both of Ill., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Sept. 30, 1974, Ser. No. 510,840
Int. Cl.² H01M 10/00
U.S. Cl. 136—6 LF **12 Claims**



1. A completely discharged, secondary electrochemical cell assembly having a cell housing, a positive and a negative electrode disposed within said housing, a molten electrolyte including a lithium salt intermediate said positive and negative electrodes, said cell as assembled comprising:

in said positive electrode, a porous containment structure penetrable by said electrolyte in molten state, a metallic mesh comprising a metal selected from the group consisting of Fe, Co, Ni, Cu and Mo disposed in said containment structure, an intimate mixture consisting essentially of solid, particulate Li_2S and said molten electrolyte embedded into said metallic mesh in uniform quantities throughout said mesh, and a positive electrode terminal in electrical contact with said mixture and said metallic mesh; and

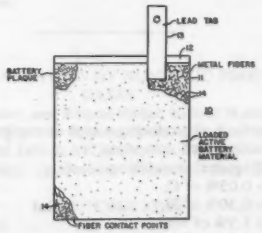
in said negative electrode, a porous solid mass consisting essentially of aluminum metal, impregnable by said electrolyte in molten state, and a negative electrode terminal in electrical contact with said porous mass of aluminum, said negative and said positive electrode terminals being electrically accessible from outside said cell housing for connection of a source of electrical potential to electrochemically form a metallic sulfide of a metal selected from the group consisting of Fe, Co, Ni, Cu and Mo within said positive electrode and lithium-aluminum alloy within said negative electrode.

9. A method of preparing an electrochemical cell having a positive electrode with iron sulfide as a reactant, a negative electrode with lithium, in the form of lithium-aluminum alloy, as a reactant, and an electrolyte including a lithium salt intermediate said positive and negative electrodes, the improved method comprising admixing particulate lithium sulfide and said electrolyte to form a uniform and intimate mixture; pressing said intimate mixture into interstices within a metallic mesh of a metal comprising Fe to form a positive electrode compact that is substantially free of iron sulfides; enclosing said compact within a containment structure including an electrical terminal in electrical contact with said compact; sealing said positive electrode compact within said cell housing along with said electrolyte and a negative electrode structure consisting essentially of a porous aluminum mass; and electrochemically charging said sealed cell to form iron sulfide within said positive electrode and lithium-aluminum alloy within said negative electrode.

3,947,292
PREPARATION OF AN ALKALINE IRON ELECTRODE MATERIAL USING SULFUR ACIDS

John F. Jackovitz, Monroeville, and Earl A. Pantier, Verona, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 116,378, Feb. 18, 1971, abandoned. This application Apr. 18, 1973, Ser. No. 352,856
Int. Cl. H01m 43/04
U.S. Cl. 136—25 **26 Claims**



1. An activated iron electrode material suitable for use in a battery electrode plate consisting essentially of (1) iron particles consisting essentially of substantially pure iron oxides selected from the group consisting of FeO, Fe_2O_3, Fe_3O_4, $Fe_3O_3.H_2O$ and mixtures thereof and (2) the chemical reaction product of an iron particle component consisting essentially of substantially pure iron oxides selected from the group consisting of FeO, Fe_2O_3, Fe_3O_4, $Fe_3O_3.H_2O$ and mixtures

thereof and at least one sulfur substituted organic acid selected from the group consisting of thiolic, dithiolic, and mercapto-carboxylic acids, said mixture containing about 0.01 to 2 weight percent total sulfur.

20. The method of claim **19** wherein the plaque is between 75 and 95 percent porous and the iron particle component is selected from the group consisting of FeO, Fe_2O_3, Fe_3O_4, $Fe_2O_3.H_2O$ and mixtures thereof.

3,947,293

METHOD FOR PRODUCING HIGH-STRENGTH COLD ROLLED STEEL SHEET

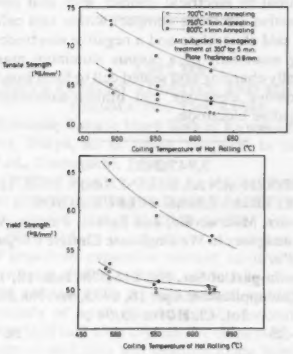
Hiroshi Takechi; Koji Ozaki; Kazuo Namba, all of Kisarazu, and Kunihiko Komiya, Kimitsu, all of Japan, assignors to Nippon Steel Corporation, Japan

Continuation-in-part of Ser. No. 432,205, Jan. 10, 1974, abandoned, which is a continuation-in-part of Ser. No. 326,490, Jan. 24, 1973, abandoned. This application Dec. 5, 1974, Ser. No. 529,831

Claims priority, application Japan, Jan. 31, 1972, 47-10555

Int. Cl.² C21D *1/78, 9/46*

U.S. Cl. 148—12 F **6 Claims**


700°C × 1mn Annealing
750°C × 1mn Annealing
800°C × 1mn Annealing
All subjected to overageing treatment at 350° for 5 mn.
Plate Thickness: 0.8mm
Tensile Strength (kg/mm²)
Coiling Temperature of Hot Rolling (°C)
Yield Strength (kg/mm²)
Coiling Temperature of Hot Rolling (°C)

1. A method of producing a high-strength cold rolled steel sheet or strip which comprises:

hot rolling steel comprising

0.05 to 0.05% of C;

0.02 to 0.30% of Si;

0.10 to 1.5% of Mn;

0.02 to 0.07% of Al; and

a total of 0.02 to 0.15% of at least one metal selected from the group consisting of Nb, V, Ti, and Zr;

with the remainder being iron and unavoidable impurities;

coiling the hot rolled steel sheet or strip at a temperature not exceeding 750°C.

cold rolling the hot rolled steel sheet or strip;

subjecting the cold rolled steel sheet or strip to annealing at a temperature between about 670°C and 900°C for 20 seconds to 10 minutes.

3,947,294

METHOD FOR TEMPER ROLLING OF A THIN-GAUGE STEEL STRIP

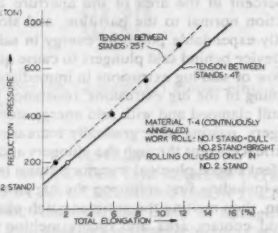
Takashi Asamura; Shigeki Sawai; Keisuke Sakamoto; Hajime Ikeda, and Tohoru Toshimitsu, all of Kitakyusyu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Feb. 6, 1975, Ser. No. 547,745

Claims priority, application Japan, Feb. 9, 1974, 49-16704

Int. Cl.² C21D *9/46*

U.S. Cl. 148—12 C **4 Claims**



1. A method of temper rolling a thin-gauge steel strip which is comprised in subjecting a steel strip obtained by hot rolling, cold rolling and annealing to mechanical working under dry condition and then rolling the steel strip using lubricant between the rolling roll and the steel strip.

3,947,295

HARD MAGNETIC MATERIAL

Yoshio Tawara, Shijonawate, and Harufumi Senno, Yamato-Koriyama, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Feb. 7, 1974, Ser. No. 440,540

Claims priority, application Japan, Feb. 9, 1973, 48-16949; May 10, 1973, 48-52409

Int. Cl.² H01F *1/04*

U.S. Cl. 148—31.57 **4 Claims**

1. A magnetic material consisting essentially of a composition expressed by the formula $Sm_uCe_{1-u}(Co_{1-x-y}Fe_xCu_y)_z$ where $0.3 \leq u \leq 1.0$, $0 \leq x \leq 0.1$, $0.09 \leq y \leq 0.18$ and $6.0 \leq z \leq 7.5$, and having a residual induction of more than 7000G, an intrinsic coercive force of more than 3000 Oe and a maximum energy product of more than 13 Mg.Oe.

3,947,296

PROCESS FOR PRODUCING STEEL SHEET OF CUBE-ON-FACE TEXTURE HAVING IMPROVED MAGNETIC CHARACTERISTICS

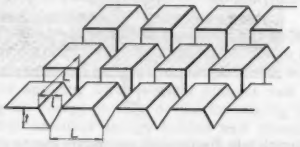
Masuji Kumazawa, Himeji, Japan, assignor to Nippon Steel Corporation, Tokyo, Japan

Filed Dec. 14, 1973, Ser. No. 424,743

Claims priority, application Japan, Dec. 19, 1972, 47-126736

Int. Cl.² H01F *1/04*

U.S. Cl. 148—111 **2 Claims**



1. A process for producing electrical sheet steel having cubic-on-face texture comprising the steps of:

initially subjecting hot rolled steel sheet to primary cold rolling with a reduction of not less than 20% utilizing a roller having a grooved surface thereon, subsequently subjecting said steel sheet to secondary cold rolling utilizing a roller having a smooth surface thereon, subjecting said sheet to decarburization annealing and thereafter subjecting said sheet to final, finishing, recrystallization annealing.

3,947,297
TREATMENT OF ALUMINUM ALLOYS

Walter H. Reimann, Xenia, and Alton W. Brisbane, Yellow Springs, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 18, 1973, Ser. No. 352,389
Int. Cl.² C21D *1/00*
U.S. Cl. 148—159 **2 Claims**

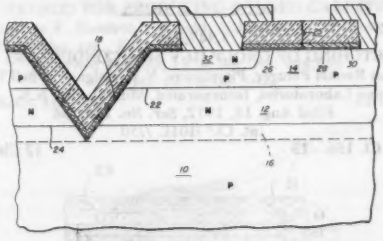
1. A process for treating an aluminum alloy of the 7000 series which comprises the steps of:

a. heating the alloy in a salt bath for about 1 hour at a temperature of about 870°F;
b. removing the heated alloy from the salt bath and immediately quenching same by immersing in a room temperature water bath;
c. soaking the quenched alloy in an oil bath for about 1 to 2 hours at a temperature ranging from about 212° to 250°F;
d. removing the alloy from the oil bath and cold working the alloy so as to deform same by about 5 to 15 percent;
e. aging the worked alloy by heating same in an air furnace for about 10 to 25 hours at a temperature ranging from about 240° to 260°F;
f. air cooling the alloy to room temperature;
g. further aging the alloy by heating same in an air furnace for about 5 to 6 hours at a temperature ranging from about 330° to 350°F; and
h. air cooling the alloy to room temperature.

3,947,298
METHOD OF FORMING JUNCTION REGIONS UTILIZING R.F. SPUTTERING

Karl H. Tiefert, Los Altos, Calif., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 436,407, Jan. 25, 1974, abandoned, which is a division of Ser. No. 242,512, April 10, 1972, abandoned. This application June 2, 1975, Ser. No. 582,941
Int. Cl.² H01L *21/283, 21/302*
U.S. Cl. 148—175 **19 Claims**



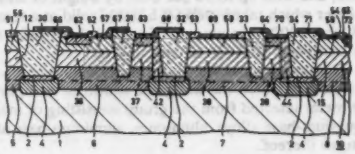
1. The method of forming one or more junction regions in a semiconductor body comprising:

diffusing an impurity from an oxidizing atmosphere thru an apertured multilayered mask on said semiconductor body, said mask comprising at least one insulating layer adjacent said body;
subjecting said body to R.F. sputtering to remove material formed in the aperture of said mask during said diffusion with said insulating layer covering the surface junctions of said junction regions with the remainder of said semiconductor body while central surface portions of said junction regions are exposed through said insulating layer; and
forming ohmic contacts to said central portions of said junction regions without removing said insulating layer.

3,947,299
METHOD OF MANUFACTURING SEMICONDUCTOR DEVICES

Bernard Hendrik Weijland, Nijmegen, and Wilhelmus Hendricus Cornelis Gerardus Verkuijlen, Eindhoven, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 465,535, April 30, 1974, abandoned, which is a division of Ser. No. 254,604, May 18, 1972. This application Jan. 9, 1975, Ser. No. 539,782
Claims priority, application Netherlands, May 22, 1971, 7107039
Int. Cl.² H01L *21/22*
U.S. Cl. 148—187 **22 Claims**



1. A method of making a semiconductor device comprising, providing a monocrystalline semiconductor silicon substrate, thermally oxidizing a limited first portion of a surface of the substrate to provide a first layer of insulating material leaving adjacent thereto exposed second portions of the semiconductor substrate, depositing on the substrate surface so as to cover both the first and second portions at least one layer of semiconductive material so as to bury the first layer, providing a material converting mask over surface portions of the semiconductive layer leaving exposed surface portions lying over the buried first layer, and subjecting the exposed surface portions of the semiconductive layer to a treatment for converting same into an insulating material until so much of the said semiconductive layer is converted that the insulating material becomes inset into the layer and extends down to the buried first layer.

3,947,300
FUEL FOR GENERATION OF NONTOXIC PROPELLANT GASES

Hermann Passauer, and Roland Hubel, both of Waldkraiburg, Germany, assignors to Bayern-Chemie, Aschau, Germany

Filed July 9, 1973, Ser. No. 377,325
Claims priority, application Germany, July 24, 1972, 2236175
Int. Cl.² C06B *35/00*
U.S. Cl. 149—35 **6 Claims**

1. A propellant composition for the generation of non-toxic propellant gases suitable for the inflation of air cushion protective devices for passengers in motor vehicles comprising mixtures of (a) at least one stable metal azide selected from the group consisting of alkali metal azides and alkaline earth metal azides, (b) at least one oxidant metal compound capable of absorbing electrons during reaction with said at least one metal azide, and (c) silicon dioxide, the total metal ion ratio relative to the metal oxides developed during the combustion assuring the formation of glasslike silicates having as

low as possible a melting point or softening point, the ratio of *a*:*b*:*c* being from 5:1:2 to 10:1:5.

3,947,301

AMMONIUM NITRATE EXPLOSIVE COMPOSITION

Joseph R. Hradel, Mt. Pleasant, Mich., and Harold E. Staadt, Tulsa, Okla., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 5, 1959, Ser. No. 784,881

Int. Cl.² C06B *33/04*

U.S. Cl. 149—43 **16 Claims**

1. An explosive slurry composition comprising a substantially saturated solution of ammonium nitrate, and suspended solids in said solution to form said slurry, said solids being comprised of at least 50 parts by weight of ammonium nitrate, and not more than 50 parts by weight of finely divided metallic alluminum of character such as to increase the sensitivity of said composition to detonation, the total nitrate comprising at least 50% of the total composition, said composition including water comprising at least 3 percent by weight of the total composition.

2. An ammonium nitrate explosive composition consisting essentially of particulate ammonium nitrate in admixture with an aqueous solution saturated with respect to ammonium nitrate, and with up to 35 per cent by weight of an inorganic sensitizer which taken alone is a stable solid at a temperature of at least 100°C. the amount of water being from 3 to 25 per cent by weight of the total composition.

3. The aqueous ammonium nitrate explosive composition as in claim **2** in which the inorganic sensitizer is a particulated light metal selected from the group consisting of magnesium, magnesium-base alloys, aluminum, aluminum-base alloys and mixtures thereof.

3,947,302

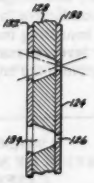
METHOD OF PRODUCING A SPECTRAL LINE REJECTION MIRROR

Jack J. Grossman, Manhattan Beach, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Division of Ser. No. 392,644, Aug. 29, 1973, Pat. No. 3,865,490. This application Sept. 3, 1974, Ser. No. 502,632

Int. Cl.² C23F *1/02*

U.S. Cl. 156—3 **5 Claims**



1. In a spectral line rejection filter, a method of producing an aspheric echelle surface mirror, which comprises the steps of:

cementing a plurality of parallel optical plate elements together to form a normally lateral stack, said optical elements being positioned with their planes extending in a normally vertical direction;

grinding a predetermined aspheric cylinder surface on a face of said stack, said aspheric cylinder surface extending longitudinally in a normally vertical direction and generally intersecting laterally across said planes of said optical elements; and

warming said cemented optical elements to permit moving thereof and sliding said optical elements to position their surface-ground ends essentially into an aspheric echelle surface coinciding with a predetermined spectral image surface of said rejection filter.

3,947,303

METHOD FOR PRODUCING A SURFACE STABILIZING PROTECTIVE LAYER IN SEMICONDUCTOR DEVICES

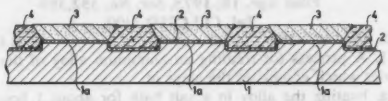
Horst Schäfer, Zirndorf, Nurnberg, Germany, assignor to Semikron, Gesellschaft fur Gleichrichterbau und Elektronik m.b.H., Nurnberg, Germany

Filed Mar. 10, 1975, Ser. No. 556,867

Claims priority, application Germany, July 30, 1974, 2436600

Int. Cl.² H01L *7/50*; B32B *31/00*

U.S. Cl. 156—3 **5 Claims**



1. In a method for producing a layer of protective lacquer on the edge surface of a semiconductor wafer in the region where the pn-junction or junctions formed in the wafer exit including the steps of: placing a plurality of semiconductor wafers, at mutual spacings appropriate for their further processing, on a plane support layer of plastic material which softens when heated so that one major surface of each wafer contacts the support layer; heating the support layer until it softens; after cooling same introducing a protective lacquer into the spaces between the semiconductor wafers to enclose the edge surfaces of the wafers in the regions where the pn-junctions exit; after hardening the protective lacquer to form a contiguous lacquer foil removing the lacquer foil together with the semiconductor wafers embedded therein from the support layer; the improvement wherein: said method further comprises the steps of providing a metallic base plate having a plurality of raised planar portions on one surface thereof with the raised portions having said mutual spacings and a surface area which conforms to the said major surface of the semiconductor wafers, and applying said support layer to said one surface of said metallic base plate prior to said step of placing; said step of placing includes placing each of said wafers on one of said raised portions; said plastic material produces an adhesive connection between the semiconductor wafers and the base plate but does not enter into a firm bond with the protective lacquer; and said step of removing includes heating the plastic material of the support layer to a temperature sufficient to cause same to again soften.

3,947,304

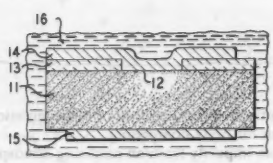
ETCHING OF GROUP III-V SEMICONDUCTORS

Lillian Rankel Plauger, Piscataway, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 15, 1972, Ser. No. 280,784

Int. Cl.² H01L *7/50*

U.S. Cl. 156—13 **12 Claims**



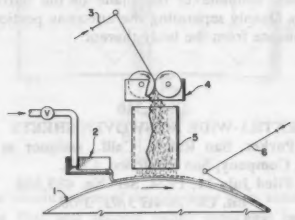
1. Method for the production of a semiconductor device comprising etching a body consisting of at least a semiconductor body and a first metallic body affixed thereto, in which at

least 99 percent by weight of the semiconductor body consists of a Group III-V compound semiconductor and in which the first metallic body includes gold, by contacting at least a portion of the semiconductor body and at least a portion of the gold with an etchant characterized in that the etchant consists essentially of an aqueous solution containing ferricyanide ions in a concentration from 0.8 molar to 1.2 molar and at least one hydroxide of the group consisting of sodium hydroxide and potassium hydroxide in a total concentration from 0.3 molar to 1.5 molar.

3,947,305
BUILDING A LAMINATION OF FIBERGLASS REINFORCED POLYESTER RESIN ON A ROTATING MANDREL

Pierre J. Leroux, and D. van de Werve de Schilde, both of Angleur, Belgium, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Jan. 22, 1973, Ser. No. 325,826
Int. Cl.² B32B *17/04*; **B65H** *81/02*
U.S. Cl. 156—62.4 **5 Claims**

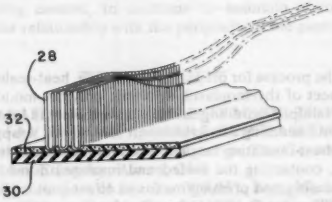


1. A process for building a fiberglass reinforced polyester lamination on a spirally rotating mandrel comprising:
depositing an unsaturated polyester resin on the surface of the rotating mandrel,
depositing pieces of chopped fiberglass onto the surface of the polyester resin
impressing the chopped fiberglass into the resin by the pressure of a plurality of strands that run substantially parallel to the path of a point on the surface of the rotating mandrel and
said rotating mandrel having longitudinal movement along the axis of rotation in such a manner that a point on the mandrel surface passes under the resin, fiberglass and strand applications several times.

3,947,306
METHOD FOR PRODUCING BONDED CARPETING

Laurence F. Haemer, Fairfield, N.J., assignor to Congoleum Industries, Inc., Kearny, N.J.

Filed Feb. 20, 1974, Ser. No. 444,058
Int. Cl.² B32B *5/00*
U.S. Cl. 156—72 **11 Claims**

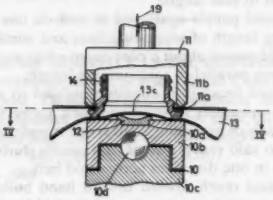


1. A method for producing carpeting of the type having pile yarns adhesively secured to a backing comprising:
a. providing a thin flexible core member having longitudinal and transverse axes,
b. winding a continuous yarn around said core member substantially perpendicularly to said longitudinal axis so as to form a plurality of elongated loops conforming to the cross-sectional configuration of said core member,
c. positioning said core member having said yarn wound thereon on a backing sheet so that said longitudinal axis is parallel to said sheet and said transverse axis is perpendicular to said sheet and one end of each of said loops contacts said backing sheet,
d. adhering said one end of said loops to said backing sheet,
e. cutting the other ends of said loops, and
f. removing said core member.

3,947,307
APPARATUS FOR FLUID-TIGHT WELDING OF A CLOSABLE CONNECTING PIECE INTO A THIN-WALLED CONTAINER

Kurt Buchscheidt, Ettlingen, Baden, Germany, assignor to Elbatainer Kunststoff-und Verpackungsgesellschaft mit beschrankter Haftung, Ettlingen, Baden, Germany

Filed July 29, 1974, Ser. No. 492,924
Claims priority, application Germany, Aug. 1, 1973, 2338908
Int. Cl.² B32B *5/18*
U.S. Cl. 156—73.1 **5 Claims**

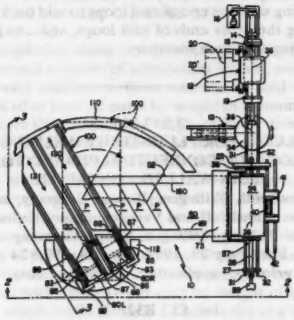


1. In a process for fabricating a container having a closable fitting, the improvement which comprises in combination:
a. forming a container body with a relatively thin wall from a thermoplastic synthetic-resin material and an opening in the wall;
b. introducing into said opening the neck of a tubular connecting piece having an annular flange substantially thicker than said wall and composed of thermoplastic synthetic-resin material, said flange being formed with an annular ridge engaging the interior of said wall around said opening;
c. pressing an annular ultrasonic welding tube against said wall directly opposite said ridge and supporting said container through an opposite wall thereof directly against said piece with an ultrasonic welding anvil;
d. applying ultrasonic welding energy to said tool thereby fusing the first-mentioned wall to said ridge and said flange; and
e. applying pressure between said tool and said anvil during the application of ultrasonic energy to cause said first-mentioned wall to bond to said flange and flatten said ridge.

3,947,308
TIRE BUILDING MACHINE

Max D. Brinkley, North Canton, and Robert I. Griffiths, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 323,030, Jan. 12, 1973, Pat. No. 3,867,228. This application Oct. 30, 1974, Ser. No. 519,367
Int. Cl.² B29H *17/02, 17/20*
U.S. Cl. 156—133 **6 Claims**



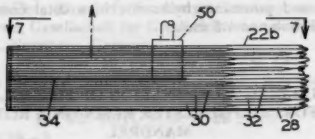
1. A method of building a giant tire comprising the steps of:
cutting a plurality of successive panels of predetermined length from a running length of ply stock having a multiplicity of reinforcement cord elements extending therein parallel to said length;
spacing said panels apart end to end on one surface of a running length of separating liner and winding said liner and said panels about a core beam while maintaining said elements parallel to said running length;
passing said beam in a direction parallel to said cord elements repeatedly forward and back across the horizontal top reach of an endless belt while transferring from said liner to said reach one of said panels during successive passes in one direction across said belt;
moving said reach foward toward band building means a distance which is a function of the width of said panel in the direction of such movement as such pass is completed and joining the longitudinal edge of each successive panel to the adjacent edge of the next preceding panel to form an integral single length of tire ply stock;
juxtaposing said belt and tire band building means and then rotating said belt and said means at like surface speeds to transfer said ply from said reach of belt to said means and wind said ply about said means; and
transferring the band from said band building means to a tire carcass building drum and thereafter effecting completion of the tire.

3,947,309
PITCHED WOODEN TRUSS WITH INTEGRAL RIDGE CONNECTOR

Arthur L. Troutner, Boise, Idaho, assignor to Trus Joist Corporation, Boise, Idaho

Division of Ser. No. 352,102, April 18, 1973, abandoned. This application Sept. 6, 1974, Ser. No. 503,958
Int. Cl.² B27M *1/08;* **B32B** *31/18, 31/20*
U.S. Cl. 156—248 **4 Claims**

1. The method of making a structural wood product which comprises:
a. providing a plurality of wood laminae,
b. applying glue to the faces of the laminae,
c. laying the laminae face to face to form a stacked assembly,
d. including between confronting end portions only of selected laminae of the assembly a glue-impervious barrier sheet,

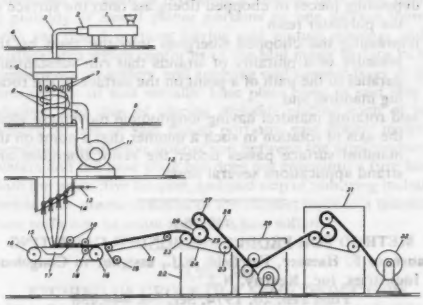


e. pressing the assembly and permitting the glue to set, and
f. cutting across a side face of said end portion of the resulting glued laminate to the plane of the barrier sheet, thereby cleanly separating the cut-away portion only of the laminate from the body thereof.

3,947,310
EXTRA-WIDE NONWOVEN SHEETS

Phillip H. Parker, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed July 11, 1974, Ser. No. 483,200
Int. Cl.² D04H *3/03, 3/08*
U.S. Cl. 156—289 **5 Claims**

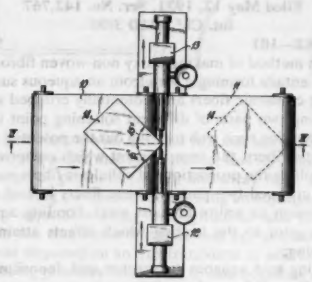


1. The process for preparing extra-wide, heat-sealed nonwoven sheet of thermoplastic synthetic polymer monofilaments which comprises folding said nonwoven sheet in layers, inserting heat-insulating fabric between said layers, wrapping additional heat-insulating fabric around fold areas connecting said layers, contacting the folded and insulated nonwoven sheet with heating and pressing means to effect heat sealing of said monofilaments in each layer of said nonwoven sheet, unfolding the heat-sealed nonwoven sheet, removing the insulating fabric and contacting the fold areas with heating and pressing means to effect heat-sealing of said monofilaments in said nonwoven sheet in said fold areas.

3,947,311
METHOD AND APPARATUS FOR CEMENTING IN THE MANUFACTURE OF DOUBLE-PANE INSULATING GLASS UNITS

Friedrich G. K. Jarchow, Essen-Bredeney; Dietrich Haensel, Bochum; Willi Hempelmann, Herne; Rainer Sturmath, Hattingen; Hans Ringleben, Essen-Bredeney, and Walter Knabel, Munich, all of Germany, assignors to Friedrich G. K. Jarchow and Hans Ringleben, both of Essen-Bredeney, Germany

Filed Nov. 20, 1973, Ser. No. 417,494
Claims priority, application Germany, Nov. 23, 1972, 2257377; Feb. 24, 1973, 2309295
Int. Cl.² B32B *31/00*; **B05B** *7/00*
U.S. Cl. 156—357 **22 Claims**



1. In the manufacture of double-pane glass insulating units comprising first and second panes separated by a frame-shaped spacer and formed into a pane package by the injection of a cement into an interspace along the periphery of the pane package, which interspace is limited by the outside of the spacer and edges of the two panes projecting beyond the spacer, the improved apparatus for injecting the cement comprising:

A. a conveyor means for carrying the pane package,

B. pressure roller means for holding the pane package on the conveyor,

C. two nozzle means for injecting cement into the interspace,

D. control means responsive to the presence of the two nozzle means at a common starting region for causing the two nozzles to begin injecting cement into the interspace at said common starting region on the periphery, responsive to the continued proximity of the two nozzles to the interspace to cause the nozzles to continue to inject the cement into the interspace while causing the two nozzles to move in opposite directions along the periphery, and responsive to the presence of the two nozzle means at a common terminal region for causing the nozzles to cease to inject cement into the interspace as the two nozzles reach a common terminal region, and

E. means for rotating the nozzles to cause them, while injecting cement, to continue to maintain a constant angular relationship with the periphery of the pane package.

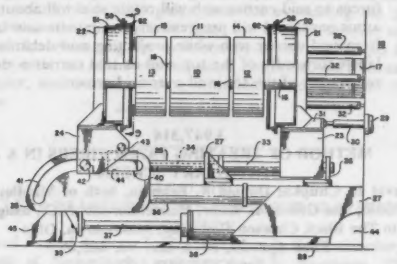
3,947,312
APPARATUS FOR MAKING PNEUMATIC TIRES TORICALLY WITH AN ANNULAR GUIDE ASSEMBLY

Virgil E. Henley, Akron, Ohio, assignor to The General Tire and Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 398,051, Sept. 17, 1973, abandoned. This application Nov. 26, 1974, Ser. No. 527,328
Int. Cl.² B29H *17/16*
U.S. Cl. 156—415 **9 Claims**

1. In apparatus for making pneumatic tires and including a rotatable building drum adapted for use in building a tire carcass and expanding the carcass to a toric shape, and a transfer means for positioning a tread and belt assembly substantially concentrically over and radially spaced from said drum, the improvement which comprises:

two annular guide members coaxial with said drum and movable axially toward and away from one another between a widely spaced retracted position and an inward operating position surrounding said drum for contacting said tire carcass on expansion thereof said guide members

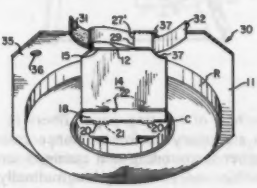


each comprising a core ring of circular cross section, supported at spaced circumferential locations, and rolling means received on said core ring and adapted for free rotary movement thereon about the circular axis defined by the center of the core ring cross section, whereby said tire carcass on expansion thereof contacts said guide members in rolling engagement with said rolling means so that said guide members guide said carcass to accurately mate with said tread and belt assembly.

3,947,313
PRESSURE SENSITIVE LABEL DISPENSER

Harlow E. Lichtwardt; Bruce Schrier; Frank Crutchley, all of Charlotte, and Thomas White, Greensboro, all of N.C., assignors to Rexham Corporation, New York, N.Y.

Filed Aug. 13, 1974, Ser. No. 496,974
Int. Cl.² B65D *5/72*, *85/67*
U.S. Cl. 156—584 **9 Claims**



1. An improved dispenser assembly for a roll of delaminable tape including pressure sensitive labels removably adhered to a release coated carrier web, said tape being wound about a cylindrical support core, said assembly comprising

a. a paperboard blank cut and scored to define rear wall, top wall, front wall, arbor wall, and connecting wall panels consecutively articulated along parallel lines of weakness;

b. said top wall having an elongated stripper panel articulated to the front edge thereof along a line of weakness extending thereacross and a transverse slot formed therein;

c. said top wall, arbor wall and stripper panels being of equal width and being of substantially equal width to that of said roll of labels;

d. said blank being folded about said roll with said arbor wall panel extending through said core, said rear wall and

connecting wall panels being joined to define an open-ended carton tube;

e. said stripper panel being sharply infolded to define a stripping crown along its line of junction with the top wall panel;

f. the free end of said carrier web being threaded along said stripper panel and rearwardly over said top wall panel and then downwardly through said slot and then rearwardly of said top wall;

g. whereby the application of rearwardly directed tensile forces to said carrier web will rotate said roll about said arbor panel and will progressively delaminate said labels from said carrier web while projecting said delaminated labels forwardly of the top wall as said carrier is drawn rearwardly of the top wall over said crown.

3,947,314

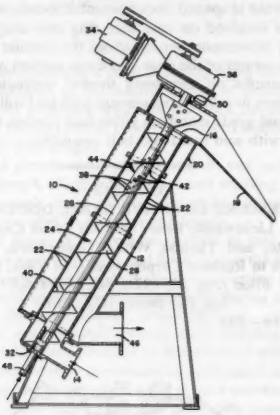
METHOD OF TREATING PAPER FIBERS IN A STATIONARY SCREEN

David E. Chupka; Donald F. Lehman, both of Middletown, Ohio, and Gilbert E. Kohr, Hendersonville, N.C., assignors to The Black Clawson Company, Middletown, Ohio

Filed Apr. 29, 1974, Ser. No. 465,095

Int. Cl.² D21D *5/22*

U.S. Cl. 162—55 **8 Claims**



1. A method of treating paper fibers in a screen which includes a stationary perforated inner casing, a stationary outer chamber surrounding said casing, a screw mounted for rotation within and extending longitudinally of said casing, means for rotating said screw in a direction such that material deposited in one end of said casing is carried to the opposite end of said casing by rotation of said screw, means defining an inlet into said casing adjacent said one end thereof, means defining an accepts outlet from said chamber, and means defining a rejects outlet from said casing adjacent said opposite end thereof, said method comprising the steps of:

a. feeding a mixture of liquid and fibers containing a substantial amount of solid rejects into said stationary, perforated, inner casing through said inlet thereinto,

b. draining substantially all of said liquid and accepted fibers through perforations in said stationary, perforated, inner casing into said chamber while retaining substantially all of said solid rejects within said casing,

c. rotating said screw within and with respect to said stationary inner casing and conveying said solid rejects retained in said stationary casing from said one end to said opposite end thereof,

d. discharging said solid rejects through said rejects outlet at said opposite end of said stationary casing,

e. collecting said liquid and fibers draining through said stationary perforated casing in said chamber surrounding said casing, and

f. removing liquid and accepted fibers from said chamber through said accepts outlet.

3,947,315

METHOD OF PRODUCING NON-WOVEN FIBROUS MATERIAL

Malcolm Kenneth Smith, Great Kingshill near High Wycombe, England, assignor to Wiggins Teape Research & Devel. Ltd., London, England

Filed May 12, 1971, Ser. No. 142,767

Int. Cl.² D21D *3/00*

U.S. Cl. 162—101 **9 Claims**

1. In the method of making bulky non-woven fibrous material which entails forming a web from an aqueous suspension containing cellulosic fibers and potentially crimped synthetic fibers having two parts of different softening point temperatures and heating such web to bring out the potential crimp in the synthetic fibers, the improvement which comprises:

a. controlling the proportions of cellulosic fibers and potentially crimped two part synthetic fibers in said aqueous suspension to assure at most weak bonding among the fibers prior to the heating which effects attainment of crimping;

b. foaming said aqueous suspension and depositing it as a layer in such foamed condition;

c. forming said web with weak bonding by draining and then drying the layer of step (b); and then

d. releasing the potential crimp of said synthetic fibers by heating said web while supported substantially free from restraint against shrinkage to a temperature below the lower of said softening point temperatures whereby to produce a bulky non-woven fibrous material.

3,947,316

METHOD OF PREPARING THE BACKER FOR THE MANUFACTURE OF MAN-MADE LEATHER

Milan Kremr, and Vaclav Hrabovsky, both of Otrokovice, Czechoslovakia, assignors to Statni vyzkumny ustav kozedelny, Gottwaldov, Czechoslovakia

Continuation-in-part of Ser. No. 845,893, July 29, 1969, abandoned, and a continuation-in-part of Ser. No. 850,236, Aug. 14, 1969, Pat. No. 3,652,381. This application Dec. 21, 1971, Ser. No. 210,562

Claims priority, application Czechoslovakia, Aug. 16, 1968, 5939-68; June 27, 1968, 4726-68

Int. Cl.² D21F *11/00*

U.S. Cl. 162—129 **7 Claims**

1. A method of preparing a backer for the production of man-made upper or fancy leather containing collagen fibers, comprising the steps of preparing a porous textile screen, swelling substantially untanned collagen fibrous material in an aqueous solution, said swollen collagen fibrous material being of a size capable of being retained on the surface of said screen, depositing said swollen collagen fibrous material on at least one side, salting the assembly thus formed, gradually pressing said collagen and said screen to the complete compression of the collagen fibrous material, covering said collagen fibrous material after compression thereof with a web comprising material selected from the group consisting of synthetic fibers, natural fibers and their mixtures, subjecting said covered assembly to needle punching in wet condition to drive the fibers of said collagen fibrous material into the pores of said screen so that the content of the collagen fibrous material ranges from 20 to 50% by weight of the total solids and thereafter tanning and drying the covered assembly.

3,947,317
APPARATUS FOR ADJUSTING AND INDICATING POSITION OF A BREAST BOX LIP

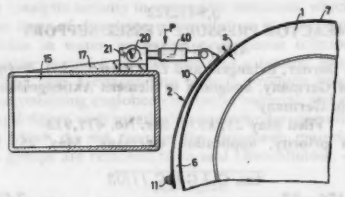
Wolf Gunter Stotz, Ravensburg, and Otto Hildebrand, Taldorf, both of Germany, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Apr. 23, 1974, Ser. No. 463,277

Claims priority, application Switzerland, Apr. 24, 1973, 5806/73

Int. Cl.² D21F 7/06

U.S. Cl. 162—263 **8 Claims**



1. In combination with a breast roll and a movable lip of a breast box of a paper making machine, said lip being movable over a range of positions toward and away from said breast roll; an adjusting mechanism comprising an adjusting rod, said rod being adjustable along a longitudinal axis of said rod parallel to the transverse width of said lip; at least one connecting rod disposed on an axis transverse to said longitudinal axis and being pivotally connected to said adjusting rod at one end of said connecting rod and to said lip at an opposite end of said connecting rod; means having an indicating line representative of the motion of said lip in said range; an indicator extending transversely from said longitudinal axis of said adjusting rod for movement with said adjusting rod, said indicator being disposed over said indicating line to indicate the position of said lip in said range.

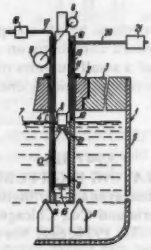
3,947,318
LIQUID-METAL-COOLED REACTOR

Ivan Ilich Zhuchkov, ulitsa 22 Partsiezda, 6/2, kv. 60, Gorky; Viktor Sergeevich Filonov, ulitsa Raspletina, 1, kv. 19, Moscow; Boris Ivanovich Zaitsev, ulitsa Shalyapina, 15, kv. 131, Gorky; Lev Nikolaevich Artemiev, ulitsa Generala Zimina, 9, kv. 3, Gorky, and Vladimir Vildanovich Rakhimov, prospekt Lenina, 28, korpus 13, kv. 16, Gorky, all of U.S.S.R.

Filed Nov. 1, 1973, Ser. No. 411,816

Int. Cl.² G21C 17/06

U.S. Cl. 176—19 R **3 Claims**



1. A liquid-metal-cooled reactor comprising: a housing; a core in said housing; fuel elements in said core; stacks of said fuel elements in said core; a first rotatable plug having at least one hole; a second rotatable plug disposed in said housing and accommodating said first plug; a recharging mechanism; a drive in said recharging mechanism for moving through said hole along the longitudinal axis of the reactor with the aid of said drive; a rod inside said guide tube, having an inner space, for gripping the fuel-element stacks and remove them from said core into said guide tube; a gripper in said inner space of the latter; a device for detecting stacks with leaky fuel elements; said guide tube also serving as a sampler in said detecting device; said sampler having an inner space for receiving inert carrier gas fed under pressure thereto and to degas a coolant sample; means inside said guide tube for introducing the carrier gas into said sampler; means inside said guide tube for evacuating the gas together with gases evolved from the coolant sample; and means for measuring the radioactivity of the carrier gas together with that of the evolved gases, both removed from said sampler, and communicating with said inner space of the latter.

3,947,319
NUCLEAR REACTOR PLANTS AND CONTROL SYSTEMS THEREFOR

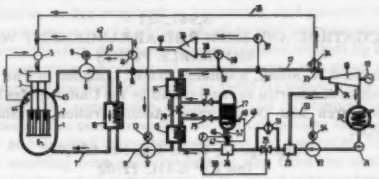
Gerard Arnold de Boer, Leiden, and Max de Hes, Leiderdorp, both of Netherlands, assignors to N.V. Neratoom, The Hague, Netherlands

Filed Apr. 5, 1973, Ser. No. 348,206

Claims priority, application Netherlands, Apr. 10, 1972, 7204745

Int. Cl.² G21D 5/08

U.S. Cl. 176—65 **12 Claims**



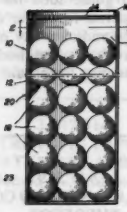
1. A nuclear reactor plant intended for supplying heat to a steam generator comprising a primary circuit filled with a heat-transferring medium which is different from water and equipped with at least a nuclear reactor, a pump and the primary section of a heat exchanger; a secondary circuit filled with a heat-transferring medium which is different from water and equipped with at least the secondary section of said heat exchanger, the primary section of said steam generator and a second pump; a tertiary circuit filled with water and steam and equipped at least with the secondary section of said steam generator, a steam turbine with controllable shut-off valve, a condenser with a condensate pump, a feed water pump and a feed water conduit provided with a controllable feed water valve and extending from the pressure side of the feed water pump to said steam generator; and a first regulating means to control the mass-flows in said primary circuit and said secondary circuit in a manner dependent on the steam power supplied to the turbine and wherein said feed water conduit and the devices forming part thereof are so constructed and dimensioned as to cause at full load between the ends of the feed water conduit a pressure difference of at least 10 bars.

3,947,320

NICKEL CONTAINER OF HIGHLY-ENRICHED URANIUM BODIES AND SODIUM

Walter H. Zinn, Hinsdale, Ill., assignor to The United States of America as represented by the United States Energy Research & Development Administration, Washington, D.C.

Filed Apr. 1, 1953, Ser. No. 346,084
Int. Cl.[2] G21C *3/22*
U.S. Cl. 176—72 1 Claim



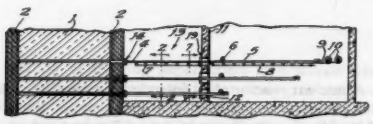
1. A fuel element for a neutronic reactor comprising a cylindrical fluid-tight container of nickel, a plurality of solid substantially spherical bodies of uranium containing about 93.5% U^{235} within the container a coating of nonfissionable, corrosion-resistant material covering each body, the bodies having substantially equal diameters, the diameter of the container being an odd multiple of the diameter of the bodies, the bodies being disposed in layers between the ends of the container each layer having a central body with two orbits about it, the inner orbit having six bodies and the outer orbit having twelve bodies, and sodium within the container, the sodium and the uranium bodies entirely filling the container.

3,947,321

CONTROL AND SHIM ROD ARRANGEMENT WITH MOVEABLE PLUGS

Montford H. Smith, Richland, Wash., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Apr. 2, 1946, Ser. No. 658,947
Int. Cl.[2] G21C *11/02*
U.S. Cl. 176—87 4 Claims



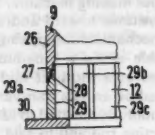
1. In combination with a neutronic reactor having a mass of moderator in which is disposed fissionable material enclosed in a biological shield of sufficient radiation absorption characteristics and thickness to protect living organisms outside it by absorbing neutrons, gamma rays and other radiation emanating from the mass, a lateral face on said biological shield having a plurality of apertures to pass only a plurality of control rods, said control rods being of equal length and comprising neutron absorbing material, said mass having passages aligned with said apertures, linear extensions on said control rods at the ends opposite to the ends disposed toward the mass, and driving means associated with said extensions adapted to impart movement to said control rods into and out of said passages in the mass, the improvement comprising a second shield of hydrogenous concrete forming a complete enclosure over said lateral face of the biological shield and having a wall parallel with said lateral face distant therefrom the length of the neutron absorbing portions of the control rods and a small part of their extensions, said parallel wall having apertures aligned with said passages in the mass to permit said extensions to pass between said complete enclosure and said driving means, shield gates comprising movable plugs mounted in front of each of the plurality of apertures in the biological shield and shield gates comprising movable plugs mounted in front of each of the apertures in the second shield, and means for moving said plugs laterally to open and close said apertures.

3,947,322

REACTOR PRESSURE VESSEL SUPPORT ARRANGEMENT

Heinrich Dorner, Erlangen, and Eberhard Michel, Nurnberg, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed May 21, 1974, Ser. No. 471,913
Claims priority, application Germany, May 25, 1973, 2326907
Int. Cl.[2] G21C *11/08*
U.S. Cl. 176—87 7 Claims



1. A nuclear reactor pressure vessel support arrangement comprising a vertical substantially cylindrical pressure vessel having top and bottom portions, a substantially circular downwardly facing surface connected to said bottom portion, and a substantially circular upwardly facing surface on which said downwardly facing surface rests and which is fixed against displacement; wherein the improvement comprises said surfaces being substantially frusto-conical shapes with said upwardly facing surface upright and said downwardly facing surface inverted and slidable on said upwardly facing surface.

3,947,323

FERMENTATION PROCESSES

Murray Moo Young, 300 Regina St. N., Apt. 1-1206, Waterloo, Ontario, Canada

Filed Aug. 14, 1974, Ser. No. 497,306
Int. Cl.[2] C12D *13/10*
U.S. Cl. 195—65 9 Claims

1. A fermentation process which comprises forming amylase in an aqueous culture containing an Aspergillus species, a nutrient therefor and a small quantity of a polymeric material selected from a carboxypolymethylene, a polyacrylate and a polyethylene glycol.

3,947,324

METHOD FOR ISOLATING HIGH PURITY PEROXIDASE

Krishnaiyer Lakshminarayanan, Arlington Heights, Ill., assignor to G. D. Searle and Co., Chicago, Ill.

Filed Apr. 21, 1975, Ser. No. 569,678
Int. Cl.[2] C07G *7/022*
U.S. Cl. 195—66 R 10 Claims

1. A method for isolating peroxidase enzyme from plant tissue containing peroxidase enzyme comprising treating aqueous extracts of said plant tissue having a pH adjusted to 6 – 9 with at least 2.7×10^{-3} moles per liter of zinc ion to form a zinc ion-protein contaminant precipitate and supernate, removing the precipitate, and separating the peroxidase enzyme from the supernate.

3,947,325

PREPARATION OF HIGH PERMEABILITY CELLULOSE FIBERS CONTAINING ENZYMES

Dino Dinelli, San Donato Milanese; Francesco Bartoli, Rome, and Silvio Gulinelli, Monterotondo, all of Italy, assignors to Snamprogetti S.p.A., San Donato Milanese, Italy

Filed Apr. 11, 1974, Ser. No. 460,225
Int. Cl.² C07G 7/02
U.S. Cl. 195—68 5 Claims

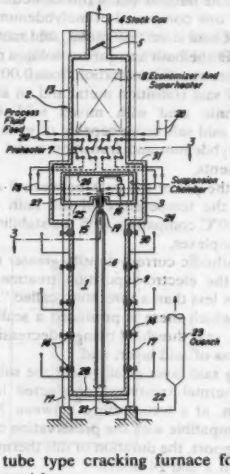
1. The process of preparing cellulose fibers of high permeability containing englobed enzymatic material adapted to exert catalytic activity in enzymatic reactions, which consists of the steps of dissolving nitrocellulose in a solvent which is insoluble in water, preparing an aqueous solution of said enzymatic material, emulsifying said solutions, spinning said emulsion into a coagulating bath to produce nitrocellulose fibers containing englobed enzymatic material, and then treating said fibers with a reducing agent under operating conditions which do not damage the enzymatic material so that nitro groups are removed from said nitrocellulose.

3,947,326

VERTICAL TUBE TYPE CRACKING FURNACE

Noriaki Nakase, Nagano, and Yoshiaki Nagamine, Osaka, both of Japan, assignors to Mitsui Shipbuilding & Engineering Co. Ltd., Tokyo, Japan

Filed Mar. 18, 1974, Ser. No. 451,924
Claims priority, application Japan, Mar. 22, 1973, 48-32850
Int. Cl.² B01D 1/00; C10G 1/02
U.S. Cl. 196—110 3 Claims



1. A vertical tube type cracking furnace for cracking a process fluid, comprising:

a combustion chamber;

a plurality of vertical reaction tubes suspended in a straight row along a central portion of said combustion chamber;

burner means on opposite side walls of said combustion chamber for heating said reaction tubes in said combustion chamber;

heat-resistant walls defining a suspension chamber above said combustion chamber isolated from the combustion gases;

suspension means in said suspension chamber for suspending said reaction tubes;

a convection-heating chamber means positioned above said suspension chamber for pre-heating said process fluid;

fluid connection means extending from said convection-heating chamber means to said reaction tubes; and

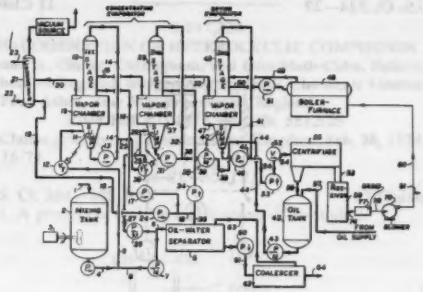
exhaust gas passage ways surrounding said suspension chamber on at least two sides thereof and connecting said combustion chamber to said convection-heating chamber means, said gas passage ways being substantially symmetrical, a vertical plane extending through said row of tubes and with respect to said combustion chamber and said convection chamber means, whereby exhaust gas flows serially therethrough without passing laterally across said tubes and suspension means.

3,947,327

PROCESS AND APPARATUS FOR RECOVERING CLEAN WATER FROM AQUEOUS WASTES

Charles Greenfield, Murray Hill; Robert E. Casparian, Boonton, and Anthony J. Bonanno, Parsippany, all of N.J., assignors to Hanover Research Corporation, East Hanover, N.J.

Filed July 22, 1971, Ser. No. 165,070
Int. Cl.² B01D 1/26, 3/34, 3/02
U.S. Cl. 203—7 15 Claims



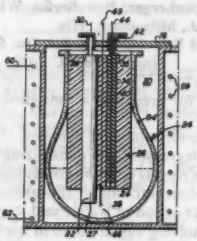
1. A process for recovering clean water from aqueous wastes by evaporation while avoiding corrosion and scaling and fouling in the evaporating apparatus, said process comprising the steps of (1) adding an oil to said aqueous wastes; (2) concentrating the oil and aqueous wastes mixture by heat in an evaporator wherein said mixture comes in contact with the evaporating surface thereof to yield (i) water vapor and any distillable components of said oil and (ii) concentrated aqueous wastes containing said oil; (3) condensing said water vapor and distilled oil components, and (4) separating liquid water resulting from said condensing step from the distilled and recondensed oil components in the liquid mixture thereof.

3,947,328

GLUCOSE LEVEL TEST METHOD

Robert M. Friedenberg, 8792 Oxwell Lane, Laurel, Md. 20810; John L. Yoscak, 2893 Balmoral Drive, Rockville, Md. 20850, and Stephen E. Noren, 1813 Mt. Pisgah Lane No. 124, Silver Spring, Md. 20903

Filed June 15, 1973, Ser. No. 370,238
Int. Cl.² G01N 27/46, 31/00
U.S. Cl. 204—1 T 13 Claims



1. Process for measuring the concentration of reactable components in the body fluid such as glucose in terms of the

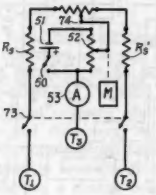
residual redox potential of a primary cell, comprising reacting a measured sampling of human body fluid to be tested with at least one standard solution containing a measured excess quantity of reducible copper salt reagent under fixed reaction temperature conditions to react with a reactive component such as glucose of the body fluid contained in the test sample, and then measuring the redox potential developed by the reagent left in the reacted solution acting as the electrolyte of a primary cell as an indication of the quantity of the reacted components that was present in the test sample.

3,947,329

METHOD OF MEASURING ACCELERATED CORROSION RATE

Robert G. Seyl, 1123 Mulford St., Evanston, Ill. 60202

Filed Dec. 9, 1974, Ser. No. 530,870
Int. Cl.² G01N 27/46, 27/26
U.S. Cl. 324—29 **11 Claims**



1. A circuit isolation device having variable isolation resistor ratio, for cathodically polarizing two duplicated electrodes positioned in the non-gaseous ionic conductor of a corrosion cell without interfering with corrosion current measurement made on one or both of said electrodes, including two isolation resistors, two cathodic terminals each connected to a first end of said isolation resistors and for connection to said two electrodes, a source of DC voltage, means for variable voltage delivery connected across said source of DC voltage, a DC current indicating device connected in series with a lead from said means for variable voltage delivery, an anode terminal connected to the positive lead from said means for variable voltage delivery and for connection to an anode electrode, a ratio resistor connected in series with a second end of said two isolation resistors, and a connection from the negative lead of said means for variable voltage delivery to a contact arm traversable along the resistor element of said ratio resistor.

3,947,330

METHOD OF ELECTRODEPOSITION

Guenter J. Heidenberger, New Berlin, Wis., assignor to Roll Chemical, Ltd., Milwaukee, Wis.

Filed Feb. 12, 1975, Ser. No. 549,165
Int. Cl.² B41C 3/08
U.S. Cl. 204—17 **3 Claims**

1. A process for preparing a rotogravure printing cylinder comprising:

a. providing a metallic base cylinder,

b. cleaning, degreasing and deoxidizing said base cylinder,

c. preparing a parting solution consisting of egg albumin and water in a concentration of approximately 400 mg. of egg albumin per gallon of water, said step of preparing comprising dissolving egg albumin in capsule form in water,

d. applying a film of said parting solution onto said base cylinder, and

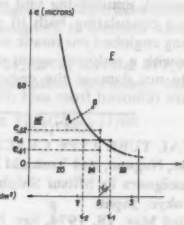
e. electro-depositing a shell of metal onto the treated cylinder.

3,947,331

METHODS FOR FORMING AN ELECTROLYTIC DEPOSIT CONTAINING MOLYBDENUM ON A SUPPORT AND THE PRODUCTS OBTAINED THEREBY

Vu Quang Kinh, Paris, and Jean Montuelle, Bourg-la-Reine, both of France, assignors to Agence Nationale De Valorisation De La Recherche (ANVAR), France

Continuation-in-part of Ser. No. 202,011, Nov. 24, 1971, abandoned. This application June 18, 1973, Ser. No. 370,629
Claims priority, application France, Feb. 21, 1973, 73.06047
Int. Cl.² C25D 5/50, 3/56, 5/10
U.S. Cl. 204—37 R **20 Claims**



1. An electrolytic method for producing, on an electrically conductive support, a codeposit layer of molybdenum and at least one transition metal selected from the group consisting of Ni, and Co, in which the support to be protected is at the cathode and the bath in which this cathode is immersed contains at least one compound of molybdenum and at least one compound of said transition metal, said method comprising,

providing in the bath an aqueous soluton of: an alkali metal molybdate at a concentration from 0.008 M/l to 0.05 M/l, a salt of said transition metal and an alkali-metal salt of an organic acid with mixed acid-alcohol functional groups, said salt being capable of giving complexes with the molybdenum and transition metal ions of the other constituents,

adjusting the pH of the bath between 9 and 11 and maintaining the temperature of the bath at a temperature above 20°C compatible with the stability requirements of said complexes,

using a cathodic current density greater than 5 A/dm²,

pursuing the electro-deposition treatment for a duration which is less than a threshold, called "scaling duration", above which there is produced a scaling of the deposit formed, said threshold being a decreasing function of the thickness of said layer, and

subjecting said layer of alloy and the sub-adjacent support to a thermal treatment conducted in a non-oxidizing medium, at a temperature between 700°C and 1200°C and compatible with the preservation of the properties of said support, the duration of this thermal treatment being between 2 and 24 hours.

3,947,332

PREPARATION OF HETEROPOLY ACIDS OF TUNGSTEN AND MOLYBDENUM

Clarence D. Vanderpool; James C. Patton, Jr.; Tai K. Kim, and Martin B. MacInnis, all of Towanda, Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed June 7, 1974, Ser. No. 477,257
Int. Cl.² C25B 1/22, 1/24; C01G 39/00, 41/00
U.S. Cl. 204—86 **5 Claims**

1. Electrolytic method for producing heteropoly acids of tungsten and molybdenum containing at least one hetero atom, comprising applying an electrical potential of from about 5 to 80 volts across a cation exchange membrane, the anodic side of which is in contact with an aqueous solution of a first metal salt selected from the group consisting of alkali

metal tungstates and molybdates, and a second metal salt of a hetero atom selected from the group consisting of alkali metal salts of P, As, Si, Ge, Ti, Co, Fe, Al, Cr, Ga, Te, B, Pt, Be, I and Ni, the concentration of the first and second metal salts in solution being from about 10 to 900 grams per liter, and the polarity of the applied potential being such as to cause removal of the metal cations from the solution and the formation of a soluble heteropoly acid in the cation-depleted solution.

3,947,333
NOVEL CATHODE

Giuseppe Bianchi, and Antonio Nidola, both of Milan, Italy, assignors to Electronor Corporation, Panama City, Panama

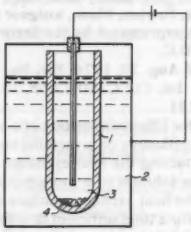
Filed Apr. 30, 1974, Ser. No. 465,529
Claims priority, application Italy, June 25, 1973, 25776/73
Int. Cl.² C25B *1/04, 11/04*
U.S. Cl. 204—129 **4 Claims**

1. A method of electrolysis of a sea water electrolyte comprising passing an electrolysis current from an outside source through an electrolysis cell having a cathode of an electrically conductive electrode base having an outer coating on at least a portion of its exterior of an alloy of palladium and 10 to 50% by weight of either silver or lead and containing the sea water electrolyte.

3,947,334
APPARATUS FOR PURIFYING SODIUM

Atsuo Yamanouchi, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed Oct. 27, 1971, Ser. No. 192,937
Claims priority, application Japan, Nov. 11, 1970, 45-98729
Int. Cl.² C25F *1/00*
U.S. Cl. 204—140 **8 Claims**



1. An apparatus for purifying liquid sodium comprising an air tight container for encasing an oxygen containing liquid sodium to be purified, a solid electrolyte member for encasing a liquid reducing agent and disposed in said container so that at least a portion of said electrolyte member will be immersed in the oxygen containing liquid sodium to be purified and encased by said container, and anode arranged for contacting the liquid reducing agent, an external electrical means for applying a positive potential to said anodes and a negative potential to the sodium to be purified, whereby the oxygen in the sodium to be purified is transferred through said electrolyte and removed by the liquid reducing agent.

3,947,335
ISOTOPE SEPARATION BY SELECTIVE PHOTODISSOCIATION OF GLYOXAL

John B. Marling, Pleasanton, Calif., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Mar. 4, 1975, Ser. No. 555,315
Int. Cl.² B01J *1/10*
U.S. Cl. 204—158 R **6 Claims**

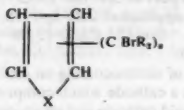
1. A method of separating isotopes which comprises subjecting glyoxal vapor to electromagnetic radiation having a predetermined wavelength such that photon absorption selectively excites molecules of glyoxal containing a desired isotope of carbon, oxygen, or hydrogen and induces dissociation of the selectively excited molecules into a product enriched in the desired isotope, and separating the isotopically enriched dissociation product from the reaction mixture.

3,947,336
HALOGENATION OF HETEROCYCLIC COMPOUNDS

James A. Clarke, Cottingham, and Otto Meth-Cohn, Salford, both of England, assignors to Synthetic Chemicals Limited, Four Ashes, near Wolverhampton, England

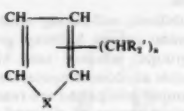
Filed Feb. 21, 1975, Ser. No. 551,525
Claims priority, application United Kingdom, Feb. 28, 1974, 9116/74
Int. Cl.² B01J *1/10*
U.S. Cl. 204—158 HA **17 Claims**

1. A process of making a compound of Formula 1



1

from a compound of Formula 2



2

in which *n* is 1 or 2, X is oxygen or sulphur, the radicals R and R′ may be the same or different and are Br, hydrogen or an aliphatic or aromatic group, and in which each ring may contain additional substituents provided that at least one CH group is unsubstituted, the process comprising gradually adding bromine to an organic liquid phase containing the compound of Formula 2 and reacting the bromine with the compound in the organic liquid phase in the presence of a radical initiator and illumination by visible or ultra violet light, the rate of addition of bromine being such that the liquid phase substantially never acquires a red brown colour.

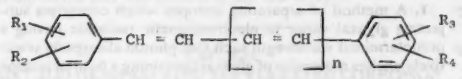
3,947,337
α,ω-DIARYLPOLYENE PHOTOSENSITIZERS FOR SULFONYLAZIDE POLYMERS

Gerret M. Peters, Jr., Meriden; Fred A. Stuber, North Haven, and Henri Ulrich, Northford, all of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 359,132, May 10, 1973, Pat. No. 3,879,463. This application Dec. 23, 1974, Ser. No. 535,706
Int. Cl.² C08F *8/00, 8/34;* **C08L** *25/04;* **G03C** *1/68*
U.S. Cl. 204—159.15 **5 Claims**

1. A process for sensitizing a light-sensitive polymer containing sulfonazide groups to radiation of a wavelength greater than 400 nm said polymer being the product of reaction of a

hydroxyalkyl azidosulfonyl carbanilate with a polymer selected from the class consisting of copolymers of maleic anhydride and styrene and copolymers of maleic anhydride and methyl vinyl ether which process comprises exposing said light-sensitive polymer to said radiation in the presence of a sensitizing amount of a compound having the formula:



wherein R_1 is selected from the group consisting of hydrogen, lower-alkoxy and di(lower-alkyl)amino, R_2 is selected from the group consisting of lower-alkoxy and di(lower-alkyl-)amino, and R_3 and R_4 are independently selected from the group consisting of hydrogen, lower-alkoxy and di(lower-alkyl)amino and n is an integer from 1 to 5.

3,947,338

METHOD OF ELECTRODEPOSITING SELF-CROSSLINKING CATIONIC COMPOSITIONS

Robert D. Jerabek, Glenshaw, and Joseph R. Marchetti, Greensburg, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 193,591, Oct. 28, 1971, abandoned. This application Feb. 5, 1975, Ser. No. 547,325
Int. Cl.² C25D *13/06*
U.S. Cl. 204—181 **6 Claims**

1. In a method of electrocoating an electrically-conductive surface serving as a cathode which comprises passing electric current between said cathode and an anode in contact with an aqueous electrodepositable composition,

the improvement wherein said electrodepositable composition comprises:

A. an acid-solubilized, self-curing synthetic organic resin containing amino groups, hydroxyl groups, and blocked isocyanate groups, wherein said blocked isocyanate groups are stable at room temperature in the presence of hydroxyl or amino groups and are reactive with hydroxyl groups or amino groups at elevated temperatures, and wherein said organic resin is derived from the reaction product of,

1. an epoxy group-containing organic compound,
2. a primary or secondary amine, and
3. a partially-blocked organic polyisocyanate.

3,947,339

METHOD OF ELECTRODEPOSITING PRIMARY AMINE GROUP-CONTAINING CATIONIC RESINS

Robert D. Jerabek, Glenshaw; Joseph R. Marchetti, Greensburg, and Robert R. Zwack, New Kensington, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 203,875, Dec. 1, 1971, abandoned. This application Feb. 5, 1975, Ser. No. 547,323
Int. Cl.² C25D *13/06*
U.S. Cl. 204—181 **7 Claims**

1. In a method of electrocoating an electrically conductive surface serving as a cathode, which method comprises passing electrical current between said cathode and an anode in contact with an aqueous electrodepositable composition,

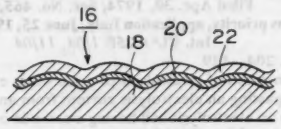
the improvement wherein said electrodepositable composition comprises an acid-neutralized, amine group-solubilized synthetic organic resin, wherein said organic resin contains hydroxyl groups curable through urethane group crosslinking, wherein at least a portion of said amine groups are primary amine groups and wherein said organic resin is formed from a compound containing epoxy functionality, at least a portion of said epoxy functionality having been reacted with a polyamine, said polyamine having latent primary amine groups blocked by ketimine groups and having at least one secondary amine group.

3,947,340

METHOD FOR FORMING γ-ALUMINA COATING ON REFRACTORY ARTICLE

Sakae Kawagoshi, and Kunio Funabiki, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Japan

Filed July 22, 1974, Ser. No. 490,664
Claims priority, application Japan, July 31, 1973, 48-85471
Int. Cl.² C25D *13/02, 13/20*
U.S. Cl. 204—181 **7 Claims**



1. A method for forming a γ-alumina coating on the surface of a refractory article, said method comprising the steps of:

coating a metal film onto the surface of the refractory article by means of electroless plating for providing conductivity on the surface of said refractory article;

immersing the coated refractory article in a suspension containing γ-alumina particles and colloidal alumina particles, said γ-alumina particles being covered with said colloidal alumina particles to form particle aggregates carrying positive charge;

making said so-coated article the cathode in an electrodeposition cell and

depositing a layer of γ-alumina particles and colloidal alumina particles on the surface of said metal film on said refractory article, by the application of an electrodeposition potential.

3,947,341

SCALE INHIBITION

Alwyn H. Taylor, Newton, Mass., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Aug. 29, 1974, Ser. No. 501,550
Int. Cl.² C25D *13/08, 13/14*
U.S. Cl. 204—181 **4 Claims**

1. A process for electrodeposition of a scale-inhibiting layer of polyphenylenediamine on a metallic heat exchange surface comprising contacting the heat exchange surface with a conductive aqueous solution of a monomeric phenylenediamine while holding the heat exchange surface at a controlled electrical potential for a time sufficient to effect polymerization of the monomer and deposition of the resulting polymer on the heat exchange surface.

3,947,342

METHOD OF FORMING A COMPOSITE ELECTRODE

Gunter A. G. Hofmann, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Division of Ser. No. 386,115, Aug. 6, 1973, Pat. No. 3,876,905. This application Jan. 24, 1975, Ser. No. 543,840
Int. Cl.² C23C *15/00*
U.S. Cl. 204—192 **1 Claim**

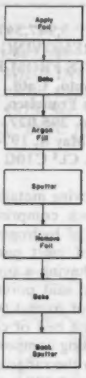
1, The method of forming a refractory coated electrode for a crossed-field switch device having a first and a second electrode spaced from each other, comprising the steps of:

positioning a refractory metal structure substantially at the location of the surface of the first electrode;

applying an interelectrode field and a crossed magnetic field to sputter material from said refractory metal structure

across the interelectrode space onto the second electrode facing the refractory metal structure;

removing the refractory metal structure and replacing the first electrode; and



back-sputtering refractory metal coating material from the second electrode to the first electrode by application of crossed electric and magnetic fields so that both of the electrodes carry refractory metal coating thereon facing the interelectrode space so that the crossed-field switch device can be operated with refractory metal-coated surfaces facing the plasma in the interelectrode space.

3,947,343
ELECTROTINNING WIRE

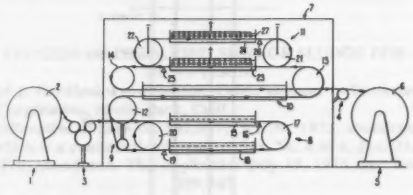
James Delves-Broughton, Nathern near Chepstow; Victor A. C. Burton, Wickford; Barry A. Kempster, Bexley, and Thomas J. Williams, Woodford Green, all of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 3, 1974, Ser. No. 457,515

Claims priority, application United Kingdom, Apr. 5, 1973, 16274/73

Int. Cl.² B65G *49/02*; C25D *17/12*, *7/06*

U.S. Cl. 204—207 **14 Claims**



1. Apparatus for continuously depositing a metal coating on a longitudinally moving wire comprising a degreasing tank adapted to contain a degreasing solution, a plating tank adapted to contain an electrolyte comprising a salt of the metal to be deposited, a source of direct current, first means for passing the wire a plurality of times through said degreasing tank, said first means including two rotatable drums about which the wire is passed each time in a loop, at least one of said drums being drivable, second means for passing the degreased wire a plurality of times through said plating tank, said second means being positioned in the wire path between said degreasing tank and plating tank and including two rotatable plating drums about which the wire is passed each time in a loop, at least one of said plating drums being drivable and at least one of said plating drums being connectible to the negative pole of said source of direct current, and a plurality of anodes connectible to the positive pole of said source and extending into said plating tank and adapted to extend into said electrolyte, means for sensing plating current, and drive means for said drivable plating drum and said drivable degreasing drum, means for inter-relating said drivable drums such that in dependence on the wire tension a predetermined amount of variation in the speed of the wire through the degreasing tank with respect to the speed through the plating tank is permitted, said inter-relating means being positioned between said degreasing and plating tanks and between said drivable drums of said first and second means, and including a dancer arm and a pulley mounted on said dancer arm adapted to direct degreased wire from said degreasing tank towards said plating tank, said dancer arm being spring biased and pivotable against the spring force in dependence on the wire tension, and a variable resistor and control circuit for adjusting the relation of wire speed to plating circuit, said pivotable dancer arm varying said resistor to adjust said relation.

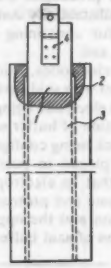
3,947,344
INERT ANODE

Nikolai Sergeevich Golikov, ulitsa Sovetskoi Armii, 33, kv. 59; Boris Iosifovich Berlin, prospekt Lenina 52/1, kv. 73; Boris Evgenievich Popov, ulitsa Sovetskaya 137, kv. 30; Andrei Dmitrievich Filatov, ulitsa Kuibysheva 21, kv. 29, and Dmitry Prokhorovich Galkin, prospekt Lenina 69, kv. 8, all of Magnitogorsk Chelyabinskoi oblatsi, U.S.S.R.

Continuation of Ser. No. 355,295, April 27, 1973, abandoned. This application Mar. 28, 1974, Ser. No. 455,958

Int. Cl.² C25D *17/12*, *17/10*

U.S. Cl. 204—286 **3 Claims**



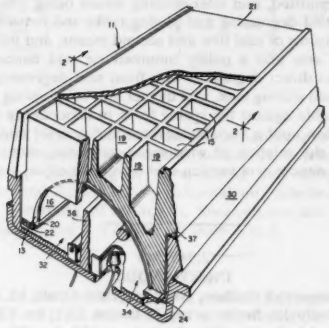
1. An electrometallurgical inert anode assembly for electrometallurgical plating baths, comprising a ferrosilicon alloy plate comprising from 10 to 20% by wt. of silicon, and from 78 to 88% by wt. of iron; a metallic bar fashioned from a metal selected from the group consisting of copper, stainless steel, cobalt, and nickel, said bar being rigidly secured in the body of said plate at one end thereof and having a current means input connected thereon; metallic wires having the same composition as said bar fastened at one end thereof to said bar, and arranged along the length of said bar, and along the length of the ferro-silicon plate to the end of said plate, said wires being rigidly connected so as to serve as the structural base therefor.

3,947,345

APPARATUS FOR ELECTROPHORESIS MIGRATION

Joseph D. Grandine, Acton, Mass.; Nat H. Marsh, Nashua, N.H., and James E. Snyder, Brighton, Mass., assignors to Millipore Corporation, Bedford, Mass.

Filed Nov. 15, 1974, Ser. No. 524,069
Int. Cl.² G01N 27/26, 27/28
U.S. Cl. 204—299 R 14 Claims



1. An apparatus for effecting electrophoretic migration on an electrophoresis slide comprising:

a mounting block having an electrically insulating thermally conducting contact surface;

means for mounting said electrophoresis slide in substantially continuous intimate contact with said contact surface;

a material, solid at room temperature, which absorbs heat while undergoing a phase change enclosed within said mounting block in thermal contact with said block to absorb heat from said electrophoresis slide by absorbing heat during the process of electrophoresis to maintain said slide at a substantially constant temperature;

reservoir means for containing two isolated portions of buffer solution; and

first and second electrodes, said first electrode being in electrical contact with said first portion of buffer solution and said second electrode being in electrical contact with said second portion of buffer solution, said reservoir and said cooling block being configured such that said cooling block may be placed in position with respect to said reservoir such that an electrophoresis slide mounted on said block has one end protruding into said first portion of buffer solution and the opposite end protruding into the other portion of said buffer solution.

3,947,346

COAL LIQUEFACTION

George J. Snell, Fords, and Joon Taek Kwon, Freehold Township, both of N.J., assignors to The Lummus Company, Bloomfield, N.J.

Filed Sept. 20, 1974, Ser. No. 507,787
Int. Cl.² C10G 1/04
U.S. Cl. 208—10 11 Claims

1. A process for separating insoluble material from a coal liquefaction product, produced from a coal feed, comprised of carbonaceous matter dissolved in a coal liquefaction solvent and insoluble material, comprising:

separating from the coal liquefaction product an essentially solid free stream and a solid containing liquid stream, including coal ash;

hydrotreating the solid containing liquid stream at hydrogenation conditions in the absence of extraneous catalyst; and

stripping the hydrotreated solid containing liquid stream to strip clean fuel components therefrom and produce a stripped flowable solid containing liquid stream having a reduced quantity of combustible products.

3,947,347

PROCESS FOR REMOVING METALLIFEROUS CONTAMINANTS FROM HYDROCARBONS

David S. Mitchell, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 295,027, Oct. 4, 1972, abandoned. This application May 8, 1974, Ser. No. 467,975
Int. Cl.² C10G 25/00
U.S. Cl. 208—251 H 4 Claims

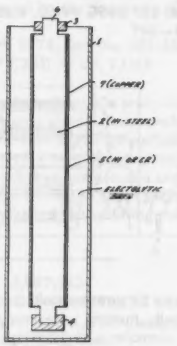
1. A process for removing metalliferous contaminants from a hydrocarbon feedstock comprising contacting said feedstock in the presence of hydrogen with a solid, said solid consisting essentially of inert particulate support material containing pores, and having a surface area in the range of from 1 to 20 m^2/gram, said pores having an average pore diameter in the range of from 1,000 to 10,000 A, and said solid being disposed as a bed of contact material and being without any hydrogenating component, said contacting being (1) at a temperature in the range of 500° to 850°F., (2) at a pressure of from 300 to 3,000 psig and (3) a liquid hourly space velocity in the range from 0.2 to 10, and said feedstock being selected from the group consisting of metal contaminated petroleum crude oils, topped or reduced crude oils, solvent deasphalted oils, distillates, heavy cycle stocks, visbreaker liquid effluent, atmospheric and vacuum crude tower bottoms, shale oils, coal tars, and tar sand oils.

3,947,348

MAKING OF A WAVE GUIDE

Paul Schabernack, Breitscheidt, and Wolfgang von Jan, Windeck, both of Germany, assignors to Kabel-und Metallwerke Gutehoffnungshutte AG, Hannover, Germany

Filed June 26, 1974, Ser. No. 483,118
Claims priority, application Germany, July 11, 1973, 2335206
Int. Cl.² C25D 1/02, 1/00
U.S. Cl. 204—9 6 Claims



1. In a method for making a wave guide of cylindrical inner surface of accurate cross-section by means of electrolytically depositing material on a mandrel for forming a tube thereon to be removed from the mandrel, the improvement comprising:

using a mandrel made of steel having 33 to 38% nickel for having a coefficient of thermal expansion sufficiently smaller than the coefficient of thermal expansion of the material as deposited on the mandrel;

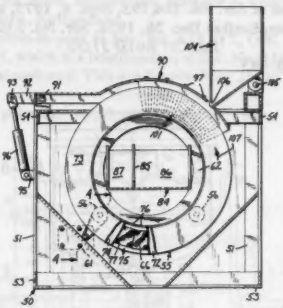
disposing the mandrel in a vertical disposition during the depositing; and

heating the tube as made subsequently to the electrolytic depositing until the mandrel separates completely from the tube permitting removal of the mandrel from the interior of the tube.

3,947,349
PERMANENT MAGNET HIGH INTENSITY SEPARATOR

Alan J. Fritz, 1615 - 9th St., NW., Grand Rapids, Minn. 55744

Filed Mar. 14, 1975, Ser. No. 558,337
Int. Cl.² B03C *1/14*
U.S. Cl. 209—214 **11 Claims**



11. The method of separating particles of magnetic and non-magnetic material in a mixture thereof which comprises the steps of:

1. supplying the material to one surface of a moving body of foraminous material;
2. vibrationally promoting the passage of non-magnetic material through said body;
3. magnetically opposing the passage of magnetic particles through said body until passage of said non-magnetic material is substantially complete, and then;
4. vibrationally promoting the passage of said magnetic material through said body.

3,947,350
PROCESS OF PREPARING SEWAGE SLUDGE FOR DEWATERING

Paul J. Cardinal, Jr., Brisbane, Calif., assignor to Envirotech Corporation, Menlo Park, Calif.

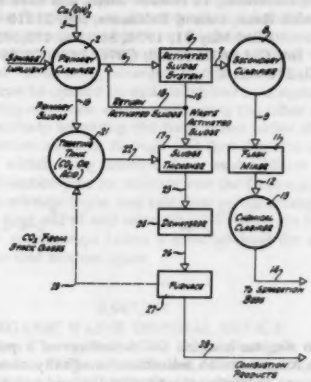
Continuation of Ser. No. 302,007, Oct. 30, 1972, abandoned, which is a continuation-in-part of Ser. No. 4,624, Jan. 21, 1970, abandoned. This application July 19, 1974, Ser. No. 489,967
Int. Cl.² C02C *3/00*
U.S. Cl. 210—10 **6 Claims**

1. An improved process for treating sewage wastewater influent to a tertiary-type wastewater treatment system of the type that utilizes lime precipitation to remove phosphates from the wastewater comprising the steps of:

a. dosing the sewage wastewater influent with sufficient calcium hydroxide to increase the pH of the sewage wastewater to at least 7.0 to precipitate at least 70% of the phosphates therefrom;

b. clarifying said dosed sewage wastewater to produce a settled sludge containing the phosphate precipitates and calcium hydroxide solids and a clarified aqueous phase;

c. carbonating the settled sludge by contacting the same with carbon dioxide to convert the calcium hydroxide solids to calcium carbonate in a molar ratio of approximately 1:1; and

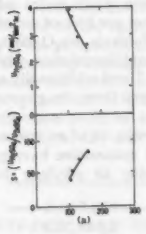


d. thereafter, without subsequent lime treatment, dewatering the carbonated sludge.

3,947,351
ACID DIFFUSION-DIALYSIS PROCESS UTILIZING ANION EXCHANGE MEMBRANE OF 4-55 MICRON THICKNESS

Tatsuro Asawa, and Tomoki Gunjima, both of Yokohama, Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 211,940, Dec. 22, 1971, abandoned. This application May 24, 1973, Ser. No. 363,494
Int. Cl.² C02B *1/56*; C08F *255/02*; B01D *13/00*
U.S. Cl. 210—22 R **7 Claims**



1. In a process for effecting diffusion-dialysis of acids, the improvement which comprises:

using a membrane 4 – 55μ thick prepared by polymerizing a monomer mixture of 100 parts by weight of γ-chloromethylstyrene and 3 – 20 parts by weight of divinylbenzene in contact with 150 – 400 parts by weight of a thermoplastic polymer, having a molecular weight of greater than 10,000 and being selected from the group consisting of polyvinylchloride, polyvinylidene chloride, polyethylene and polypropylene, and then is reacted with trimethylamine for amination.

3,947,352
POLYSACCHARIDE MATRICES FOR USE AS ADSORBENTS IN AFFINITY CHROMATOGRAPHY TECHNIQUES

Pedro Cuatrecasas, 10 Hillside Road, and Indu Parikh, 4404 Keswick Road, both of Baltimore, Md. 21210

Filed May 31, 1974, Ser. No. 475,305
Int. Cl.² B01D *15/08;* **C07G** *7/00;* **C07H** *1/00*
U.S. Cl. 210—31 C **19 Claims**

1. In the method for the activation of a polysaccharide matrix for use as an adsorbent in affinity chromatography techniques, comprising activating the said polysaccharide by oxidizing the cis-vicinal hydroxyl groups thereof with sodium metaperiodate to generate aldehyde functions, converting said aldehydic functions into Schiff bases and thence reductively stabilizing the said resultant Schiff bases, the improvement which comprises the reductive stabilization of said intermediate Schiff bases with sodium cyanoborohydride at a pH between 6 and 6.5.

3,947,353
WATER PURIFICATION PROCESS

Joachim Walter Lehmann, Kelkheim, Taunus, and Armand Lehinant, Offenbach, Main, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Apr. 3, 1974, Ser. No. 457,715
Claims priority, application Germany, Apr. 5, 1973, 2316972
Int. Cl.² C02B *1/20*
U.S. Cl. 210—52 **8 Claims**

1. In a process for the purification of textile waste water by adding thereto an aluminum salt or iron salt as an inorganic flocculant to remove suspended and colloidal matter and anions having large molecules by flocculation, the improvement, when said textile waste water additionally contains therein at least 0.1 gram per liter of dissolved sodium silicate of the approximate formula $Na_2O{\cdot}4SiO_2$, the presence of which interferes with said flocculation, which comprises maintaining a pH of 7 to 8.5 and additionally adding to said waste water a member selected from the group consisting of about 1 mol of a monoamine, or of an acid salt thereof, and about one-half mol of a diamine, or of an acid salt thereof, per mol of $Na_2O{\cdot}4SiO_2$, said monoamine having 1–6 carbon atoms and said diamine being an alkylene diamine having 1–6 carbon atoms.

3,947,354
REMOVAL OF HEAVY METAL IONS FROM WASTEWATER

Charles L. Swanson, Dunlap; Robert E. Wing, Peoria, and William M. Doane, Morton, all of Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation-in-part of Ser. No. 342,134, March 16, 1973, abandoned. This application Apr. 18, 1975, Ser. No. 569,431
Int. Cl.² C02B *1/20*
U.S. Cl. 210—53 **4 Claims**

1. A method of removing heavy metal ions from aqueous solutions comprising the following steps:

a. determining the concentration of heavy metal ions in an aqueous solution;

b. adding to said aqueous solution a water-soluble cationic polymer in amounts of from 1 to 2000 times the weight of heavy metal ions;

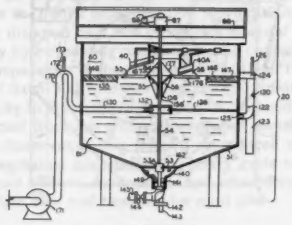
c. adding starch xanthate having a xanthate degree of substitution (D.S.) of from 0.06 to 3 to the aqueous solution resulting from step (b) in amounts sufficient to form a cationic polymer-heavy metal ion-starch xanthate complex precipitate and to place the resulting supernatant essentially in a state of balanced charge; and

d. separating said precipitate from the supernatant.

3,947,355
APPARATUS AND PROCESS OF SEPARATING PACKING HOUSE WASTE

David C. Irwin, 2900 N. Grand, Amarillo, Tex. 79107

Continuation of Ser. No. 394,793, Sept. 6, 1973, abandoned. This application Dec. 26, 1974, Ser. No. 536,459
Int. Cl.² B01D *21/26*
U.S. Cl. 210—83 **6 Claims**



1. In a process of treating a fluent mixture of packing house waste comprising water, non-floating solids and tallow, the steps comprising

a. continuously passing a mixture of said solids, water and tallow at a first vertical level into a first quiescent zone extending vertically upwards of said first vertical level and into which no agitating element enters said quiescent zone located in a vertically elongated first cylindrical container and into a second zone extending downward of said first vertical level and into which second zone no agitating element enters and

b. separating the water and tallow in said first quiescent zone and forming therefrom at the top of said first quiescent zone an upper layer of semi-liquid tallow, said layer of tallow having an upper surface level above the bottom edge of a vertically extending upwardly and forwardly sloped ramp adjacent the peripheral wall of said container;

c. moving a series of straight edged scrapers forwardly into contact at their bottom edges with the upper portions of said layer of tallow at a level above said bottom edge of said ramp and resiliently yet firmly moving said scrapers into contact at their sides with the wall of said container at the radial side of each scraper while supporting said scraper on the ramp with its bottom edge providing an upwardly, forwardly and centrally directed straight oblique line of contact with the forwardly, upwardly sloped ramp upper surface, said line extending from a rearward lower radial point to a forward elevated central point on said ramp upper surface, and thereby forming V-shaped upwardly open pockets on said ramp and

d. continually raising portions of the surface layer of tallow by moving said pockets upwardly on said ramp with increments of said layer of tallow therein above the upper surface level of said tallow, and depositing said increments of tallow in a second container separated from said first container; and

e. continually automatically cleansing the scraping elements, and

f. returning said scrapers to said first container at a predetermined height above the floor of said first container and in contact with said upper portion of layer of tallow and above said first quiescent zone and above said bottom edge of said ramp while

g. drawing off solids from said mixture at the bottom of said second zone and drawing off from said container water from which tallow has been removed at a level below said first quiescent zone and above said second zone.

3,947,356
ARRANGEMENT FOR REGULATING THE MOISTENING SOLUTION MIXTURE IN A MOISTENING SOLUTION PREPARATION PLANT FOR AN OFFSET PRINTING PRESS

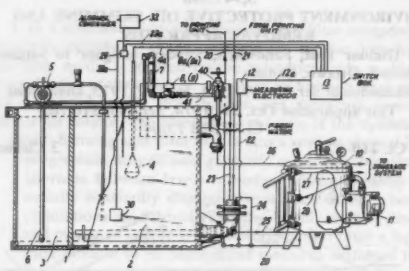
Alfons Werhli, Bern, Switzerland, assignor to Maschinenfabrik Wifag, Bern, Switzerland

Continuation-in-part of Ser. No. 515,817, Oct. 18, 1974, abandoned, which is a continuation of Ser. No. 416,743, Nov. 19, 1973, abandoned. This application May 21, 1975, Ser. No. 579,688

Claims priority, application Sweden, Nov. 20, 1972, 15084/72

Int. Cl.² B01D *23/26*

U.S. Cl. 210—96 R **1 Claim**



1. Arrangement for regulating the moistening solution mixture in a moistening solution preparation plant for use in an offset printing press comprising a tank having two separate spaces with one space containing a moistening solution mixture and the other space containing a moistening solution additive, a float switch positioned within the moistening solution mixture space, an injector above the moistening solution additive space, a suction pipe connected to the injector and extending downwardly into the space containing the moistening solution additive, a conduit system connected to said injector and suction pipe and including a line extending from said injector into said moistening solution mixture space, a flow detector in said conduit system and connected to said injector, a first solenoid valve connected to said flow detector, a second solenoid valve connected to said moistening solution mixture space, wherein the improvement comprises that a crystal sand filter and a circulating pump associated with said filter are located in said conduit system for filtering the moistening solution mixture from said moistening solution mixture space for feeding a portion of the filtered mixture to the printing press and for returning a portion into the moistening solution mixture space in said tank, a pH measuring electrode in said conduit system, a switch box, a first electrical line connecting said pH measuring electrode to said switch box, a second electrical line connecting said float switch to said switch box, a third electrical line connecting said first solenoid valve to said switch box, a fourth electrical line connecting said second solenoid valve to said switch box, said switch box including a line recorder, an acid content regulator a pH-meter and switches arranged to regulate the moistening solution mixture, said conduit system further comprising a first line connecting said mixture space to said filter through said pump, a feed line for flowing the moistening solution from said filter to the printing press, a first branch line connecting said feed line to said measuring electrode, a second branch line connecting said feed line to said mixture space, a second line connecting said measuring electrode to said mixture space, a return line for flowing the moistening solution from the printing press to said mixture space, a third line connecting a source of fresh water to said first and second solenoid valves, said solenoid valves being arranged so that one of said solenoid valves can be opened by said switch box by a signal from said measuring electrode while maintaining the other closed thereby selectively admitting the fresh water either directly into said mixture space or through said flow detector to said injector for withdrawing additive from said additive space through said suction pipe for mixture with the fresh water and flow into the mixture space, and said float switch arranged for operating at least one of said solenoid valves when the level in said mixture space drops below a selected level for adding make-up into said mixture space.

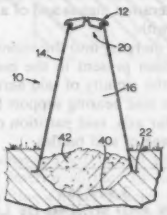
3,947,357
ORGANIC WASTE DISPOSAL DEVICE

Richard Sutton Cherry, Don Mills, Canada, assignor to The Apollo-Dynamic Corporation Limited, Mississauga, Canada

Filed Apr. 26, 1974, Ser. No. 464,544

Int. Cl.² B01D *43/00*

U.S. Cl. 210—170 **9 Claims**



1. A system for containing organic waste material comprising a receptacle body having a circumferential wall defining a chamber pyramidal and truncated in axial cross section, each end of said body defining an opening into said chamber, a cap constructed and arranged to press fit onto the body at its narrow end to provide closure means therefor, an outstanding annular flange connected to the opposite wide end of said pyramidal chamber at the peripheral edge of said circumferential wall defining an opening into said chamber, said annular flange arranged beneath the surface of the earth anchoring said receptacle in the ground at the wide end of said receptacle body whereby the narrow end of said receptacle and its closure means extends upwardly and is spaced above the surface of the ground.

3,947,358
METHOD FOR BIOLOGICALLY TREATING SEWAGE AND AN INSTALLATION FOR CARRYING OUT THE METHOD

August Schreiber, and Berthold Schreiber, both of Hannover-Vinnhorst, Germany, assignors to August Schreiber, Germany

Filed May 6, 1974, Ser. No. 467,669

Claims priority, application Germany, Mar. 15, 1974, 2412543

Int. Cl.² C02C *1/12*

U.S. Cl. 210—194 **8 Claims**

1. An apparatus for biologically treating sewage comprising:

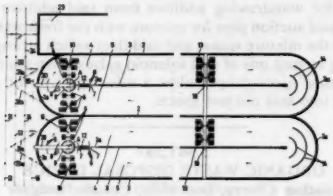
an elongated circulation tank;

a longitudinally extending central partition extending upwardly of the bottom wall of said tank, said partition

terminating adjacent to and at a distance from opposite end walls of said tank, thereby defining two parallel flow channels connected together at opposite ends, said tank end walls having an outwardly curved, approximately semicircular profile;

an aerator mounted on a bearing support for rotation about an axis perpendicular to said bottom wall and located on the longitudinal axis of said tank, said aerator having aeration means near its base for aerating the sewage as said aerator rotates;

sewage inlet and outlet means on said tank respectively open in direction of sewage flow within said tank;



said partition extending toward and adjacent to said perpendicular axis, for decelerating the sewage circulating about said aerator and said partition having openings for the passage of said aeration means and of air supply conduits associated therewith;

said flow channels merging into the vicinity of said aerator in full cross-section present in the portion of the flow channels out of the vicinity of said aerator; and,

baffles mounted on said bearing support for rotation about said perpendicular axis, said partition openings also permitting the passage of said baffles.

3,947,359

AERATION AND MIXING OF LIQUIDS

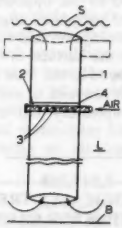
Alec Hibburd Laurie, 21 Lyndewode Road, Cambridge, England

Filed Mar. 6, 1974, Ser. No. 449,208

Claims priority, application United Kingdom, Mar. 6, 1974, 10956/74

Int. Cl.² B03D *1/24*; G05D *11/02*

U.S. Cl. 210—221 P **14 Claims**



1. Apparatus for promoting gas/liquid exchange, and particularly for aerating a liquid, comprising: a substantially vertically disposed open-ended riser tube having a bore therethrough and disposed in a body of liquid, with the upper end of the tube spaced below the surface of the body of liquid and the lower end of the tube close to but spaced above the bottom of the body of liquid; restrictor means located in the tube between the ends of the tube and not more than one meter from the surface of the liquid, and closing said tube to flow therethrough except for a passageway of reduced cross-section to impart turbulence to liquid flowing through the tube bore and resulting in a high velocity flow of liquid through the passageway; and gas diffuser means disposed at said restrictor means transversely to the axis of the tube and having a plurality of apertures therein arranged to introduce gas into the bore at said passageway in a direction perpendicular to the direction of flow of liquid therepast, to reduce the density of the material in the riser tube above the gas diffuser means and to induce upward flow of liquid through the bore and passageway, and wherein the rate of air supplied, the total area of the apertures in the gas diffuser means and the total area of the passage are related to the cross-sectional size of the bore, such that the velocity of liquid flowing through the passageway is eight to twelve times as great as the mean velocity of the liquid flowing through the bore of the riser tube, and wherein the gas diffuser means is positioned relative to the passageway such as to obtain laminar flow over the gas diffuser of the liquid flowing through the passageway, the velocity of the flow of liquid through the passageway resulting in shearing off of bubbles of gas leaving said apertures and thereby producing a large number of small bubbles with a resultant combined large surface area, and the high velocity flow of liquid leaving the passageway inducing substantial turbulence in the region of the riser tube bore above the passageway, to thus promote gas/liquid exchange.

3,947,360

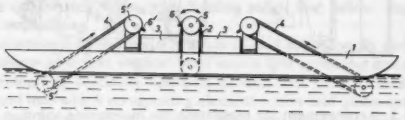
ENVIRONMENT PROTECTIVE OIL SKIMMING AND REMOVAL APPARATUS

Sven Gunnar Fast, Sandviken, Sweden, assignor to Sandco Limited, Ottawa, Canada

Continuation of Ser. No. 391,554, Aug. 27, 1973, abandoned. This application Oct. 21, 1974, Ser. No. 516,763

Int. Cl.² E02B *15/04*

U.S. Cl. 210—242 S **3 Claims**



2. Oil skimming apparatus for collecting oil or similar floating substances from a water surface comprising:

a catamaran-type boat having spaced-apart hulls, said boat being provided with drive means so as to enable boat travel in either of two opposed directions;

a belt conveyor positioned between said hulls comprising an endless belt having a smooth surface made of a material to which oil adherence is much greater than that of water, the lower roller of said belt being partially immersed in the water for effecting said oil adherence,

said belt conveyor being substantially vertically disposed at the middle of the boat as seen in the longitudinal extension thereof;

means connected to said belt for continuously driving said belt in either of two opposed directions so as to enable oil pick-up in both said directions of boat travel;

at least one holder tank on said boat;

wiping means for transference of oil from said belt to said holder tank; and

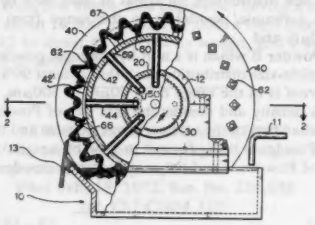
additional conveyors symmetrically arranged on both sides of said centrally disposed conveyor, said additional conveyors being disposed between said pontoons and comprising perforate endless bands disposed obliquely to the surface of the water and driven in such directions that the surfaces of said perforate endless bands facing the respective ends of said boat are both travelling upward from the water surface to collect coarse oil spills and litter from the water in either direction of travel of said boat, said centrally disposed conveyor comprising imperforate endless bands adapted to skim thin oil from the water surface,

whereby coarse oil spills, litter and thin oil are simultaneously removed from the water.

3,947,361
FILTER

Clifford E. Jackson, 10 Brant St. East, Orillia, Ontario, Canada

Continuation of Ser. No. 302,243, Oct. 30, 1972, abandoned. This application June 24, 1974, Ser. No. 482,625
Int. Cl.² B01D 33/06
U.S. Cl. 210—391 2 Claims



1. In a continuous rotary vacuum drum filter comprising a generally cylindrical shape, wherein the median location of the filter media is located on the cylindrical side as distinct from the end of the cylinder, said filter including a filter media for separating solids from liquids and there are provided means for rotating the filter about the axis of the cylinder;

means forming said filter media into a surface shaped in its progression around said generally cylindrical location to alternate between levels of nodes radially inwardly and radially outwardly disposed from each other, whereby undulations are formed extending axially of the cylinder; and means to supply to the outside of said filter a liquid-solid mixture to be filtered and means to withdraw from the inside of said filter the filtrate;

means allowing the creation of a pressure differential across the filter media due to the provision of atmospheric pressure on said one side and the provision of subatmospheric pressure on said other side;

means for intermittently directing an air blast radially outwardly through said filter media for detaching accumulated filter cake from said filter media;

wherein said filter is designed so that a mixture of liquids and solids are supplied radially outwardly of the filter media, and the liquid filtrate is withdrawn radially inwardly thereof, wherein, said filter media comprises flexible material, and wherein said filter media is shaped by a supporting plate, having passages therethrough and contoured to shape the filter media to form said undulations, when the filter media is arranged along the outside surface thereof, and means retaining the filter media on said surface;

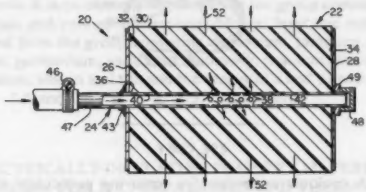
wherein said movement of said filter media away from said supporting plate is limited by rods located adjacent said filter media and on the opposite side of said filter media from the supporting plate and located in the inward nodes of said alternating levels.

3,947,362
FILTER WITH AN OPEN-CELLED ELASTOMER FOAM

Kenji Etani, W. Meadow Road, West Townsend, Mass. 01474

Continuation-in-part of Ser. No. 419,042, Nov. 26, 1973, abandoned. This application Oct. 25, 1974, Ser. No. 518,077
Int. Cl.² B01D 35/00
U.S. Cl. 210—416 4 Claims

1. A liquid filter comprising an open cell, compressible elastomeric foam body and a tubular gate, said body formed with an axial opening, at least a portion of said gate disposed within said axial opening in contact with an interior surface of said body, said gate having an open end and a closed end, said open end constituting an inlet that is operative to receive a liquid to be filtered, said body characterized by open cells which range from 10 to 400 pores per linear inch of said foam body, said body capable of transmitting a liquid from said axial opening to an exterior surface of said body, said gate characterized by interspersed open and closed increments, said closed increments at the margins of said tubular gate, said closed increments imparting rigidity to said gate, a portion of said closed increments received within said axial opening a distance that is at least equal to a radial distance from a longitudinal axis of said axial opening to the exterior surface of said body, said inlet being a closed increment of said gate, said open increments disposed between said closed increments within said axial opening of said body, the entire periphery of



said tubular gate disposed within said axial opening being in contact with said interior surface of said body, said open increments transmitting a liquid directed through said inlet to said interior surface of said body, a liquid entering said inlet being directed through said gate and passing outwardly through said open increments to said interior surface of said body, a filtered liquid exiting from the exterior surface of said body, said external exterior surface of said body being a compressible foam boundary, said body characterized by a 25 percent indentation load deflection value in the range of 1 to 200, the 25 percent indentation load deflection value being defined as pounds force per 50 square inch required for 25 percent indentation, said foam boundary being an integral continuum of said body and being supported substantially only by said gate means and said body, said elastomeric foam being composed of a material selected from the class consisting of urethane polymers and vinyl polymers.

3,947,363
CERAMIC FOAM FILTER

Michael J. Pryor, Woodbridge, Conn., and Thomas J. Gray, Halifax, Canada, assignors to Swiss Aluminium Limited, Chippis, Switzerland

Continuation-in-part of Ser. No. 430,229, Jan. 2, 1974, Pat. No. 3,893,917. This application Mar. 28, 1975, Ser. No. 563,212
Int. Cl.² B01D 39/20; C04B 21/00
U.S. Cl. 210—510 12 Claims

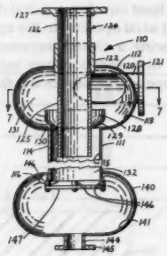
1. A high temperature resistant ceramic foam filter for use in filtering molten metal having an open cell structure characterized by a plurality of interconnected voids surrounded by a web of said ceramic, said filter having a density of less than 30% of the theoretical density for ceramic material of the same size, said foam having the followig composition: 40 to 95% Al_2O_3; 1 to 25% Cr_2O_3; 0.1 to 12% bentonite; and 2.5 to 25% of an air setting agent which is substantially nonreactive to the molten metal.

3,947,364

APPARATUS FOR REMOVING PARTICLES FROM FLUID

Claude C. Laval, Jr., 2444 N. Farris, Fresno, Calif. 93705

Filed June 13, 1974, Ser. No. 479,030
Int. Cl.² B04C 5/103, 5/04
U.S. Cl. 210—512 R 3 Claims



1. A cyclonic apparatus for removing particulate matter from fluid comprising:

A. a substantially spheroidal surge chamber having opposite open axial ends;

B. an internally screw-threaded sleeve mounted coaxially in one of the ends of said chamber;

C. an elongated cylindrical outlet conduit screw-threadably mounted in the sleeve coaxially of said chamber for axial adjustment with respect thereto and having an end extended through the chamber and through the open end of the chamber opposite to the sleeve,

1. the chamber presenting an axially disposed concave inner surface of revolution concentrically of the outlet conduit and in spaced relation thereto to define an annular opening therebetween;

D. an inlet conduit connected tangentially to the surge chamber to fill said chamber with fluid containing particulate matter and to swirl the same in said chamber about the outlet conduit;

E. a cylindrical casing connected to the surge chamber and axially extended therefrom concentrically of the outlet conduit defining an annular separation chamber therebetween;

F. a substantially hemispherical baffle mounted concentrically on the outlet conduit for axial adjustment therewith, said baffle presenting an axially disposed convex outer surface of revolution in facing and spaced juxtaposition to said concave surface of the chamber to define a passage therebetween leading to the separation chamber of a capacity adjustable by axial adjustment of the outlet conduit,

1. said convex and concave surfaces each having a radius normal to the axis of the surge chamber and a radius in a plane diametric to the surge chamber and the radius of the convex surface in both instances being less than the corresponding radius of the concave surface so that the defined constricted passage is arcuately downwardly and inwardly directed and progressively downwardly constricted to cause an accelerated swirling action through the passage to the separation chamber; and

G. a particle chamber connected to the casing adapted to have particles settle therein as the fluid passes out the outlet conduit.

3,947,365

SOLID FIRE-EXTINGUISHING COMPOSITIONS

Arnold George Cottrell, and John Malloy Paton, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Sept. 14, 1973, Ser. No. 397,325
Claims priority, application United Kingdom, Oct. 6, 1972, 46136/72
Int. Cl.² A62D 1/00
U.S. Cl. 252—5 8 Claims

1. A fire-extinguishing composition comprising

a. carbamic powder containing a major proportion by weight of the compound $KC_2N_2H_3O_3$ and having a particle size distribution such that at least 90% by weight of the carbamic powder is in the range from 0.1μm to 100μm and

b. a Powder B which is a non-hygroscopic powder having a particle-size distribution such that at least 90% by weight thereof is in the range from 50μm to 500μm,

the bulk density and median particle size of Powder B being greater than that of the said carbamic powder and the proportion of Powder B being from 5 to 50% by weight of the total weight of Powder B and the said carbamic powder.

3,947,366

SIZE FOR TEXTILE YARNS AND METHOD OF SIZING THEREOF

Kuzma Andrianovich Andrianov, Vystavochny pereulok 3, kv. 9; Lev Ivanovich Gandurin, Kotelnicheskaya naberezhnaya, 25/8, kv. 33a, both of Moscow; Alexandra Fedorovna Davydova, and Vyacheslav Ivanovich Sidorov, both of ulitsa Glavmosstroya, 1, kv. 14, Moskovskaya oblast, Solntsevo, all of U.S.S.R.

Filed July 27, 1973, Ser. No. 383,455
Int. Cl.² D06M 11/02
U.S. Cl. 252—8.6 5 Claims

1. A textile size comprising, parts by weight:

an oligomeric acrylic acid with a molecular weight of from 3,000 to 30,000: 3.0 to 15.0

an alkali metal siloxanolate of the formula:

wherein R is an alkyl group, Me is an alkali metal; n *n* is 3 to 10: 0.01 to 0.1.

3,947,367

HYDROXY ACID HEAT STABILIZERS FOR ABS RESINS LUBRICATED WITH ETHYLENEDIAMINE BIS-STEARAMIDE

Donald Henry Foelsch, Williamsport, and Donald G. Manly, West Chester, both of Pa., assignors to Glyco Chemicals, Inc., Greenwich, Conn.

Division of Ser. No. 860,045, Sept. 22, 1969, Pat. No. 3,649,585. This application Mar. 6, 1972, Ser. No. 232,267
Int. Cl.² C10M 1/32, 3/26, 5/20, 7/30
U.S. Cl. 252—51.5 A 9 Claims

1. A composition of matter consisting essentially of ethylene-diamine bis-stearamide and a substantially minor amount of at least one acid of the class consisting of malic acid, citric acid, and gallic acid, which composition is effective as a lubricant in and to enhance the heat stabilization of an acrylonitrile-butadiene-styrene resin of the type known as an ABS resin.

3,947,368
LUBRICATING OIL COMPOSITIONS

William M. Sweeney, Wappingers Falls, N.Y., assignor to Texaco Inc., New York, N.Y.

Filed Feb. 25, 1971, Ser. No. 118,989
Int. Cl.² C10M *1/28, 3/22, 5/12, 7/26*
U.S. Cl. 252—56 R 3 Claims

1. A lubricating oil composition having improved pour point characteristics which comprises a paraffinic, waxy-type, residual lubricating oil base stock and about 0.01 to about 0.50 percent by weight of an oil-soluble copolymer of ethylene and a vinyl ester of a saturated monobasic aliphatic carboxylic acid in which the carboxylic acid component of the ester has from 2 to 6 carbon atoms, said copolymer having a molecular weight of about 16,000 to about 31,000, a vinyl ester content of about 12 to about 42 percent by weight, and a melt index of about 5 to about 580.

3,947,369
LUBRICATING OIL BASE STOCK

Raymond Thomas Leibfried, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Feb. 15, 1972, Ser. No. 226,538
Int. Cl.² C10M *3/20*
U.S. Cl. 252—57 10 Claims

1. A composition of matter useful as a base stock for jet engine lubricating oils or the like, which consists essentially of a blend of (1) a pentaerythritol ester product consisting essentially of pentaerythritol material completely esterified by straight chain C_4–C_{10} alkanoic acid material, and (2) a trimellitate ester product consisting essentially of trimellitic acid completely esterified by C_4–C_{13} alkanol material, the weight ratio of the trimellitate ester product to the pentaerythritol ester product being in the range from about 1:10 to about 1:1.

3,947,370
ELECTROPHOTOGRAPHIC DEVELOPING COMPOSITIONS

Howard A. Miller, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 562,497, July 5, 1966, abandoned. This application Dec. 23, 1970, Ser. No. 101,153
Int. Cl.² G03G *9/02*
U.S. Cl. 252—62.1 P 7 Claims

1. An electroscopic developer composition comprising a mixture of toner particles and carrier particles wherein the carrier particles comprise a homogeneous dispersion of magnetically responsive particulate material in an electrically insulating material which is triboelectrically matched with the toner particles to be electrostatically attractive to the toner particles when mixed with them, the average diameter of said magnetically responsive particulate material being not greater than 20 percent of the average diameter of the carrier particles, said carrier particles having an average diameter of from about 100 microns to about 600 microns which is at least 4 times the average diameter of the toner particles.

3,947,371
DEVELOPER MATERIAL WITH POLY(p-XYLYLENE) COATED CARRIER

Richard A. Parent, Fairport, and H. Ronald Thomas, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 308,642, Nov. 21, 1972. This application July 19, 1973, Ser. No. 380,624
Int. Cl.² G03G *9/00*
U.S. Cl. 252—62.1 P 11 Claims

1. An electrostatographic developer mixture comprising finely-divided toner particles electrostatically clinging to the surface of carrier particles having an average particle size of between about 1 micron and about 1,000 microns, said carrier particles comprising a core surrounded with a thin outer coating comprising a substituted and/or unsubstituted poly(p-xylylene) polymer, said developer mixture being characterized as possessing triboelectric properties suitable for reversal development of positively charged electrostatic latent images.

3,947,372
FERRIMAGNETIC MATERIAL

Kiminari Shinagawa; Sadao Hishiyama, both of Hachioji; Hiroshi Takeuchi, Kokubunji, and Satoshi Taniguchi, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Japan

Filed July 25, 1973, Ser. No. 382,293
Claims priority, application Japan, Aug. 11, 1972, 47-79928
Int. Cl.² C04B *35/26, 35/50*
U.S. Cl. 252—62.57 8 Claims

1. A polycrystalline ferrimagnetic material having a garnet structure and comprising a yttrium or rare-earth iron garnet represented by the general formula:

$$R_{3-x}Pb_xFe_{5-y}M_yO_{12}$$

wherein R is an element selected from the group consisting of yttrium and rare-earth elements, M is at least one metal selected from the group consisting of niobium, tantalum, ruthenium, germanium, vanadium, antimony, titanium, zinconium, hafnium, silicon and tin, and the ranges of x and y are $0.05 \leq x \leq 1.5$ and $0.05 \leq y \leq 1.5$, respectively.

3,947,373
ELECTRICALLY INSULATING POWDERY MATERIAL, A PROCESS FOR ITS PREPARATION AND THERMALLY CONDUCTING AND ELECTRICALLY INSULATING FILLED RESIN COMPOSITION USING SAID INSULATING POWDERY MATERIAL AS FILLER

Shigenobu Sobajima; Minoru Tamura, both of Hachioji; Yoichi Azuma, and Kiyoshi Takekata, both of Hino, all of Japan, assignors to Teijin Ltd., Osaka, Japan

Filed Aug. 12, 1974, Ser. No. 496,834
Claims priority, application Japan, Sept. 12, 1973, 48-102223
Int. Cl.² H01B *3/00;* C08L *5/00;* H01B *7/00*
U.S. Cl. 252—63.2 7 Claims

1. An electrically insulating powdery material of a calcined product of a mixture of magnesium oxide and another metal oxide; characterized in that

i. said powdery material comprises a core of magnesium oxide particles and a sheath of a double oxide formed thereon in a surrounding manner,

ii. said double oxide is a member selected from a double oxide of magnesium oxide and boron oxide and a double oxide of magnesium oxide, boron oxide and a metal oxide selected from the group consisting of titanium oxide, iron oxide and chromium oxide, and

iii. said powdery material has a volume resistivity of at least 1×10^{10} ohms-cm, the volume resistivity being measured after boiling for 40 hours in boiling water a resin composition consisting of 100 parts by weight of a resin and uniformly dispersed therein 250 parts by weight of the powdery material.

3. A thermally conducting and electrically insulating resin composition comprising a resin and uniformly dispersed therein a powdery material of a calcined product of a mixture of magnesium oxide and another metal oxide; characterized in that

i. said powdery material comprises a core of magnesium oxide particles and a sheath of a double oxide formed thereon in a surrounding manner,

ii. said double oxide is a member selected from a double oxide of magnesium oxide and boron oxide and a double oxide of magnesium oxide, boron oxide and a metal oxide selected from the group consisting of titanium oxide, iron oxide and chromium oxide, and

iii. said powdery material has a volume resistivity of at least 1×10^{10} ohms.cm, the volume resistivity being measured

after boiling for 40 hours in boiling water a resin composition consisting of 100 parts by weight of a resin and uniformly dispersed therein 250 parts by weight of the powdery material.

5. A process for preparing an electrically insulating powdery material by calcining a mixture of magnesium oxide and another metal oxide or a metal compound capable of forming the metal oxide under the calcining conditions, characterized in that a mixture selected from the group consisting of a mixture of magnesium oxide and boron oxide and mixtures of magnesium oxide, boron oxide and a member selected from the group consisting of titanium oxide, chromium oxide, iron oxide, and titanium, iron, chromium compounds capable of forming their oxides, respectively, under the calcining conditions is calcined under the conditions expressed by the following expression:

$$\frac{80}{t} + 800 < T < \frac{80}{t} + 1200$$

wherein T is the calcining temperature (°C.), t is the calcining time (hous), and $t \geqq 1/12$.

3,947,374

SUBSTITUTED HALOTRIAZINES AS PEROXYGEN BLEACH ACTIVATORS

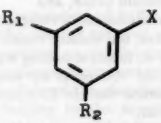
Frank Fred Loffelman, Somerville, and Thomas Eugene Brady, Piscataway, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 343,313, March 21, 1973, abandoned. This application July 16, 1974, Ser. No. 489,015

Int. Cl.² C11D 7/54

U.S. Cl. 252—102 **16 Claims**

1. A bleaching composition consisting essentially of hydrogen peroxide or a hydrogen peroxide-releasing compound and an activating amount of a halo-triazine compound represented by the formula:



where X represents chlorine and bromine; and R_1 and R_2 individually represent chlorine, bromine, hydroxy, mercapto, lower alkyl, lower alkoxy, phenoxy, dimethoxyphosphinyl or

where R_3 and R_4 individually represent hydrogen, lower alkyl, lower cyanoalkyl, lower hydroxyalkyl, ethoxyethyl, phenyl, or chlorophenyl, or where R_3 and R_4 taken together complete a ring structure selected from morpholine, piperazine, piperidine, succinimide, maleimide and phthalimide rings wherein the mole ratio of the halo-triazine compound to the hydrogen peroxide-releasing compound is from about 1:1 to about 1:10.

3,947,375

LIQUID CRYSTAL MATERIALS AND DEVICES

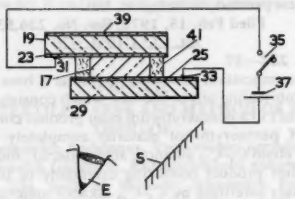
George William Gray, Cottingham, and Kenneth John Harrison, Hull, both of England, assignors to Secretary of State for Defence in Her Britannic Majesty's Government of United Kingdom of Great Britain and Northern Ireland, London, England

Filed Nov. 6, 1973, Ser. No. 413,247

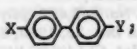
Claims priority, application United Kingdom, Nov. 9, 1972, 51698/72; July 16, 1973, 33709/73

Int. Cl.² C09K *3/34*; **C07C** *121/64, 121/66, 121/70*; **G02F** *1/01, 1/03, 1/13*; **G02B** *5/23*

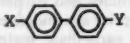
U.S. Cl. 252—299 **44 Claims**



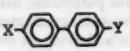
1. A liquid crystal compound having one of the following molecular structures, the molecular structure of the compound being selected from one of the following structures: the structure



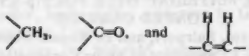
; a simple ortho-substituted derivative of the structure



wherein the substituent is selected from the group consisting methyl and halogen; and a derivative of the structure



in which a simple bridging group is contained between two of the ortho-positions of said structure and said simple bridging group is selected from the group consisting of



wherein X and Y are different para-substituents of the kind which promote liquid crystal behavior, the para-substituent X being a group selected from the following list: an alkoxy group having more than one carbon atom; an alkyl group; an alkanoyloxy group; and an alkenyl group; and the para-substituent Y being selected from the following list: a cyano group; a benzene ring substituted in the para-position by a cyano group; and a plurality of directly para-linked benzene rings in which the end ring remote from the substituent X is substituted in the para-position by a cyano group.

3,947,376

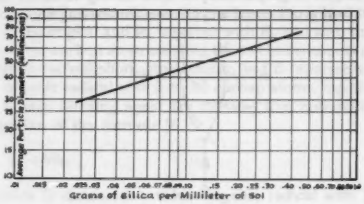
SILICA SOLS CONTAINING LARGE PARTICLE SIZE SILICA

William L. Albrecht, Naperville, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 819,861, April 28, 1969, Pat. No. 3,673,104, which is a continuation-in-part of Ser. No. 719,677, April 8, 1968, abandoned, which is a continuation-in-part of Ser. No. 453,873, April 26, 1965, Pat. No. 3,440,174, which is a continuation-in-part of Ser. No. 165,617, Jan. 11, 1962, abandoned. This application May 12, 1971, Ser. No. 142,654

Int. Cl.² B01J *13/00*

U.S. Cl. 252—313 S 4 Claims



1. A concentrated stable alkaline silica sol having a pH ranging from 7.0 to 10.0 consisting essentially of from 35% to 70% by weight of large, spherical, uniform, non-aggregated silica particles expressed as SiO_2 having a weight-average particle diameter of about 45 to about 100 millimicrons and the water as the hydrophilic liquid carrier of said particles, said sol at a 50% silica concentration having a viscosity of less than 10 cps at 25° C. and a specific conductance of less than 5,000 micromhos/cm.

3,947,377

STABILIZED INDICATOR COMPOSITIONS CONTAINING 9-(γ-AMINOPROPYL)-3-AMINOCARBAZOLE

Wolfgang Werner, Mannheim-Vogelstang; Peter Vogel, Weinheim; Hugo Tiedemann, Mannheim-Wallstadt, and Werner Guthlein, Mannheim-Neckarau, all of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany

Division of Ser. No. 326,205, Jan. 24, 1973, Pat. No. 3,822,285. This application Sept. 24, 1973, Ser. No. 399,885

Claims priority, application Germany, Feb. 8, 1972, 2205733

Int. Cl.² C09K *3/00*; G01N *31/00*, *33/00*

U.S. Cl. 252—408 12 Claims

1. Diagnostic test composition for the enzymatic detection of glucose containing 9-(γ-aminopropyl)-3-aminocarbazole or salts thereof on a film or absorbent carrier.

3,947,378

ADSORBED PLASMA

Arthur L. Babson, Chester, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 23, 1974, Ser. No. 535,879

Int. Cl.² G01N *1/00*, *33/16*, *11/00*, *31/06*

U.S. Cl. 252—408 1 Claim

1. In a process for the production of an adsorbed citrated plasma deficient in Factors II, VII, IX and X, the step which comprises stirring citrated plasma with from 20 to 22% by weight of barium sulfate at ambient temperature and then removing the adsorbent from the adsorbed plasma.

3,947,379

PROCESS FOR REDUCING NITROGEN OXIDES BY TREATING CATALYST SUPPORT AND A METAL NITRATE WITH UREA AND THEREAFTER CALCINING

Irvin Ralph Feins, Westport, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 330,166, Feb. 6, 1973, Pat. No. 3,853,788, Continuation-in-part of Ser. No. 330,167, Feb. 6, 1973, Pat. No. 3,872,030, Continuation-in-part of Ser. No. 330,169, Feb. 6, 1973, Pat. No. 3,853,791. This application Jan. 22, 1974, Ser. No. 435,554

The portion of the term of this patent subsequent to Dec. 10, 1991, has been disclaimed.

Int. Cl.² B01J *21/04*

U.S. Cl. 252—463 3 Claims

1. A process for the reduction of oxides of nitrogen in exhaust gases emanating from the calcination of a catalyst support having associated therewith a metal nitrate salt which comprises treating said support prior to calcination with urea in an amount which is from about 0.25 to about 5 moles per mole of nitrate ion present and thereafter calcining the thus-treated support without adversely affecting properties of the catalyst material being processed.

3,947,380

OXIDATION CATALYST

James M. Whelan, La Canada, Calif., and Richard J. Brook, Didcot, England, assignors to University of Southern California, Los Angeles, Calif.

Division of Ser. No. 99,239, Dec. 17, 1970. This application Feb. 26, 1974, Ser. No. 445,986

Int. Cl.² B01J *23/10*

U.S. Cl. 252—462 3 Claims

1. A ceramic, nonstoichiometric, electrically neutral catalyst for treating exhaust gases from the combustion of fossil fuels comprising a homogeneous mixed oxide compound having a unitary crystal structure and having the following empirical formula:

$$X_nJ_{(1-n)}ZO_{(3-m)}$$

wherein:

X is an alkaline earth metal or mixture thereof;

J is scandium, yttrium, a rare-earth element, or mixture thereof;

Z comprises manganese, at least 0.01% of Z having an oxidation state other than +3;

m is a number other than 0 having a value up to about 0.11; and

n is a number other than 0 having a value up to about 0.51.

3,947,381

METHOD OF MAKING A CATALYST

John Stewart Campbell; Phineas Davies, and John Russell Richmond, all of Stockton-on-Tees, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 182,147, Sept. 20, 1971, abandoned. This application Dec. 17, 1973, Ser. No. 425,281

Claims priority, application United Kingdom, Oct. 8, 1970, 47914/70

Int. Cl.² B01J *23/40*, *23/74*

U.S. Cl. 252—466 B 2 Claims

1. A method of making a catalyst which comprises mixing together, in finely-powdered form, a Group VIII metal oxide, a hydraulic binding agent, forming the mixture into compressed pellets having a pellet density in the range of 0.9 to 1.3, treating said pellets with water or steam or both, then drying and reducing with a reducing agent at 200°–400°C.

3,947,382
MILDNESS ADDITIVE

Ralph Kelly, Cincinnati, and Edmond Jean Ritter, Loveland, both of Ohio, assignors to Cincinnati Milacron, Inc., Cincinnati, Ohio

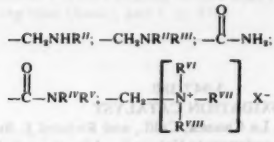
Continuation of Ser. No. 140,604, May 5, 1971, Pat. No. 3,769,242, which is a division of Ser. No. 696,509, Jan. 9, 1968, Pat. No. 3,630,934, which is a continuation-in-part of Ser. No. 613,095, Feb. 1, 1967, Pat. No. 3,538,009. This application Oct. 16, 1973, Ser. No. 406,955

Int. Cl.² C11D *3/04, 3/30, 3/32*

U.S. Cl. 252—542 **15 Claims**

1. A detergent composition consisting essentially of a nonionic organic detergent and from 0.005 to 10 parts by weight per part by weight of said detergent of a mildness additive comprising

I. the substituted polymerized product of 2 to 4 molecules of a monomeric C_{12} to C_{26} unsaturated fatty acid, wherein said polymerized product contains a cyclohexene moiety and instead of 2 to 4 carboxyl groups from said fatty acid, radicals selected from the group consisting of $—CH_2NH_2$; $—CH_2NHCH_2CH_2CH_2NH_2$;



and morpholido; in which R^{II}, R^{III}, R^{IV}, R^{V} are aliphatic or aromatic hydrocarbon radicals of 1 to 12 carbon atoms; or where R^{II} and R^{III} combine to form a 3 to 6 membered ring with the amino nitrogen; R^{VI}, R^{VII}, and R^{VIII} are lower alkyl radicals and X^- is an anion; or

II. the saturated products defined in (I); said detergent composition exhibiting reduced skin irritation compared to the same composition absent the mildness additive; said detergent and mildness additive being compatible and stable in aqueous media.

3,947,383
WET STRENGTH RESIN

Joseph M. Baggett, Freeport, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 29, 1974, Ser. No. 465,041

Int. Cl.² C08G *65/26*

U.S. Cl. 260—2 BP **5 Claims**

1. In a process for making a thermosetting cationic water-soluble resin which comprises

a. forming an intermediate resin solution by reacting about 0.9 to about 2.1 moles of epichlorohydrin with one mole of ammonia in aqueous solution and maintaining the prepolymer reaction mixture thereby obtained at about 0°–100°C. until essentially no unreacted epichlorohydrin remains, and

b. reacting the intermediate resin solution thereby formed with about 0.1–1.0 part of additional epichlorohydrin based on the weight of resin in the intermediate resin solution at about 40°–100°C., the improvement of neutralizing the intermediate resin solution prior to its further reaction with additional epichlorohydrin by adding to said solution a quantity of strong base about equivalent to the ionic chloride present therein.

3,947,384
METHOD FOR MAKING MATT FINISH COATINGS

Felix Schülde, Wulfen; Johann Obendorf, Dorsten; Kurt Neubold, Gladbeck, and Günter Dörmann, Bochum, all of Germany, assignors to Veba-Chemie Aktiengesellschaft, Gelsenkirchen-Buer, Germany

Filed May 15, 1974, Ser. No. 470,232

Claims priority, application Germany, May 16, 1973, 2324696

Int. Cl.² C08G *59/50*

U.S. Cl. 260—2 N **7 Claims**

1. Powder coating composition comprising a finely divided mixture of

i. a 1,2-epoxy compound having more than one 1,2-epoxy group in the molecule and a lower melting point greater than 40°C; and

ii. a salt of a polycarboxylic acid having three or more carboxyl groups; and a cyclic amidine having the formula

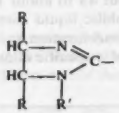
wherein

R is H, alkyl or aryl;

R′ is the same as R and in addition cycloalkyl, or a heterocycloalkyl radical obtained by substituting one or more —N—, —S—, and/or —O— atoms in a cycloalkyl ring;

R″ is alkyl and aryl substituted alkylene or arylene; and

X hydrogen or the radical



wherein

R and R′ are as defined previously.

3,947,385
MIXTURES CONTAINING PREPOLYMERS, WHICH CAN BE CONVERTED TO HEAT-RESISTANT FOAMED PLASTICS

André Schmitter, F-Hegenheim, France; Jürg Kiefer, Reinach, and Theobald Haug, Frenkendorf, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

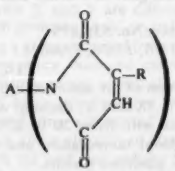
Filed Jan. 10, 1975, Ser. No. 540,026

Claims priority, application Switzerland, Jan. 16, 1974, 572/74

Int. Cl.² C08F *22/40, 30/02, 222/40, 122/40*

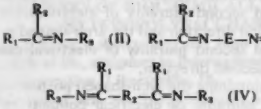
U.S. Cl. 260—2.5 N **40 Claims**

1. A mixture which can be converted to a heat-resistant foamed plastic, characterised in that it contains (1) a thermoplastic prepolymer prepared by heating, to 50° – 170°C, a mixture containing (a) a diimide or triimide of the formula I



(I)

in which A denotes a *n*-valent organic radical with at least 2 and at most 30 carbon atoms, R denotes hydrogen or methyl and *n* denotes 2 or 3 and (b) an azomethine of the formula II, III or IV



in which R_1 denotes a hydrogen atom, an aliphatic, cycloaliphatic, cycloaliphatic-aliphatic or aromatic radical with at most 12 carbon atoms, an araliphatic radical with at most 20 carbon atoms or a heterocyclic or heterocyclic-aliphatic radical, R_2 and R_3 have the same meaning as R_1, with the exception of hydrogen, and R_1 together with R_2 and with the inclusion of the carbon atom carrying the two substituents can also denote a cycloaliphatic ring system, and E represents a divalent organic radical with 2 to 30 carbon atoms, together with (2) a solid blowing agent for foaming and optionally (3) a polyamine of the formula V

$$D-(NH_2)_y \qquad (V)$$

in which D denotes a y-valent organic radical with 2 to 40 carbon atoms and *y* denotes a number from 2 to 4.

3,947,386
POLYURETHANE FOAMS STABILIZED WITH HYDROLYZABLE POLYSILOXANE COPOLYMERS

Bela Prokai, Mahopac, and Bernard Kanner, West Nyack, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 212,729, Dec. 27, 1971, Pat. No. 3,836,560, which is a continuation-in-part of Ser. No. 122,164, March 8, 1971, abandoned. This application June 27, 1974, Ser. No. 483,660

Int. Cl.² C08G *18/14*

U.S. Cl. 260—2.5 AH **14 Claims**

1. A process for preparing a shaped, foamed polyurethane article comprising shaping a curable froth which is substantially structurally stable but workable at ambient temperatures, said froth comprising

a. an organic polyisocyanate;

b. an active hydrogen compound reactive with said polyisocyanate to form a polyurethane;

c. a high molecular weight linear hydrolyzable $(AB)_n$ siloxane-polyoxyalkylene block copolymer having the average formula

$$[(R_2SiO)_x(C_nH_{2n}O)_y]_d$$

wherein R represents a monovalent hydrocarbon radical free from aliphatic unsaturation; *n* is an integer of 2 to 4 inclusive; *x* is an integer of at least 7; *y* is an integer of at least 4; *d* is an integer of at least 4; the average molecular weight of each siloxane block ranges from about 500 to about 10,000; the average molecular weight of each polyoxyalkylene block ranges from about 300 to about 10,000; the siloxane blocks constitute from about 20 to about 50 weight percent of the copolymer; the polyoxyalkylene blocks constitute about 80 to about 50 weight percent of the copolymer; and the block copolymer has an average molecular weight of at least about 65,000; and

d. an inert normally gaseous gas substantially uniformly dispersed throughout said froth; and maintaining the resultant shaped froth at a temperature sufficient to cure it and set its shape.

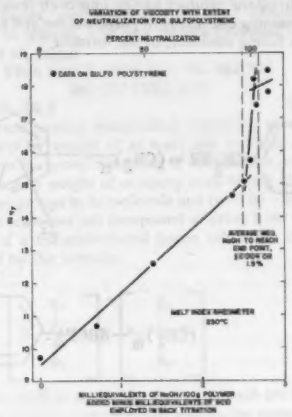
3,947,387
NOVEL IONIC FOAMS

Robert D. Lundberg, Somerville, N.J., assignor to Exxon Research and Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 346,093, March 29, 1973, Pat. No. 3,867,319. This application Feb. 6, 1975, Ser. No. 547,639

Int. Cl.² C08F *47/10*; C08J *1/28*

U.S. Cl. 260—2.5 R **13 Claims**



1. A foamed polymeric product comprising an ionic polymer, said ionic polymer comprising from about 0.4 to 10 mole percent pendant acid groups, said pendant acid groups being selected from the group consisting of sulfonic, carboxylic and phosphonic acid groups, and said pendant acid groups being neutralized to a degree of at least 97%.

3,947,388
FOAMED PLASTICS AND PROCESS FOR PREPARING THE SAME

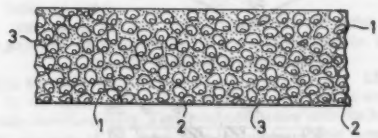
Hideo Ohkawa, and Masami Tomikawa, both of Chiba, Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

Filed May 23, 1974, Ser. No. 472,797

Claims priority, application Japan, May 30, 1973, 48-60453

Int. Cl.² C08J *9/18*; C08K *7/20*

U.S. Cl. 260—2.5 R **6 Claims**



1. Foamed plastics with improved mechanical strength and enhanced light reflection ability, which comprises foamed thermoplastic resin and glass beads of from 1 to 2 mm in diameter dispersed in said foamed resin.

3,947,389

POLYURETHANE PRODUCT WITH GAS FADING INHIBITOR AND METHOD OF INHIBITING THE GAS FADING OF POLYURETHANE PRODUCT

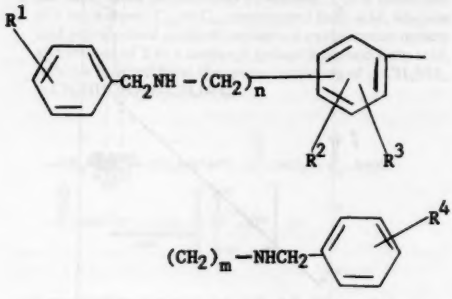
Masatomo Ito; Tsuneo Gotoh, both of Yokohama, and Shizuo Nishino, Kyoto, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo and Meisei Kagaku Kabushiki Kaisha, Kyoto, both of, Japan

Division of Ser. No. 413,252, Nov. 6, 1973, abandoned. This application Feb. 27, 1975, Ser. No. 553,625

Int. Cl.² C08J 3/20

U.S. Cl. 260—2.5 BB 10 Claims

2. Polyurethane product having improved resistance to gas fading consisting essentially of polyurethane and a compound, as the gas fading inhibitor, of the formula,



wherein R^1, R^2, R^3, and R^4 are independently selected from the group consisting of hydrogen, methyl and ethyl, and n and m are each an integer from 1 to 3, in the amount of from about 0.1 to about 10% by weight of the polyurethane.

3,947,390

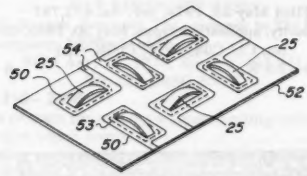
ARCH SHAPED SNAP-TYPE SWITCH CONTACT

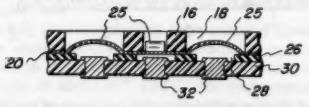
Wendell C. Johnson, Topanga, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 23, 1974, Ser. No. 508,485

Int. Cl.² H01H 13/26, 1/06

U.S. Cl. 200—5 R 13 Claims





1. A switch assembly comprising, in combination:

a first member supporting a first plurality of stationary electrical contacts,

a second member supporting a second plurality of electrical contacts, each of said second plurality of electrical contacts having a forcibly movable arch-shaped portion supported at both ends thereof, the arch-shaped portion of some of said second plurality of electrical contacts extending in a first direction and the arch-shaped portion of other of said second plurality of electrical contacts extending in a second direction,

first means for maintaining the arch-shaped portion of each of said second plurality of electrical contacts in axial alignment with a different one of said stationary electrical contacts with said arch-shaped portion of each of said second plurality of electrical contacts being oriented such that it is arched away from its associated stationary electrical contact, and

second means for applying a force to the archshaped portion of a selected one of said second plurality of electrical contacts to change the shape of the arch-shaped portion of said selected one of said second plurality of electrical contacts such that it is forced into assuming a shape arched toward its associated stationary electrical contact to thereby effect a switching action, the arch-shaped portion of said selected one of said second plurality of electrical contact assuming its original shape when said force is no longer applied thereto.

3,947,391

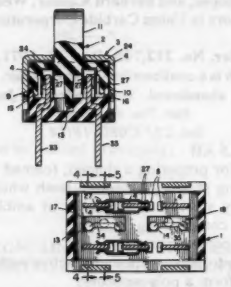
ELECTRICAL SLIDE SWITCH

Kurt Lutzenberger, Arlington Heights, Ill., assignor to Switchcraft, Inc., Chicago, Ill.

Filed Sept. 20, 1974, Ser. No. 507,721

Int. Cl.² H01H 15/06, 1/50

U.S. Cl. 200—16 D 8 Claims



1. An electrical slide switch comprising a housing, a slidable electrical conductor blade, an actuator for said conductor blade mounted in said housing and a base having a plurality of fixed electrically conducting terminals mounted therein in spaced relationship electrically insulated from one another to receive and establish contact with said slidable conductor blade as it is moved from one position to another so as to electrically connect a plurality of said terminals, lifting means operative to lift away the portion of said slidable conductor blade which normally contacts a terminal and to retain said portion in lifted position as said slidable conductor blade is moved from one terminal and approaches a second terminal until said slidable conductor blade reaches a predetermined contacting position with respect to said second terminal, said slidable conductor blade comprising first projecting contacting portions which establish electrical contact between said blade and said terminals and second projecting portions which project toward said terminals but do not contact them and said lifting means comprising projections from said base which engage said second projecting portions and spread them so that said contacting portions are held away from said termi-

nals as the slidable conductor blade is moved between terminals.

3,947,392

FOUNDRY SAND COMPOSITIONS CONTAINING GRAFT COPOLYMERS OF BIOCHEMICALLY-SYNTHESIZED HETEROPOLYSACCHARIDES

William J. Lang, Libertyville, and John J. Krajewski, Wheeling, both of Ill., assignors to International Minerals & Chemical Corporation, Libertyville, Ill.

Division of Ser. No. 757,473, Sept. 4, 1968, Pat. No. 3,645,937. This application Oct. 1, 1971, Ser. No. 185,804

Int. Cl.² C08L *5/00*; **B22C** *1/26*, *1/22*

U.S. Cl. 260—17.4 GC **16 Claims**

1. A foundry molding composition comprising a major amount of foundry sand and minor amounts of clay, water, and a water-soluble graft copolymer, said graft copolymer being present in an amount sufficient to enhance the workability of said composition and being of the group consisting of a graft copolymerization product of acrylic acid and from about 0.1 to about 10% by weight, based on the weight of said acrylic acid, of a biochemically-synthesized heteropolysaccharide, and water-soluble salts of said graft copolymerization product, said biochemically-synthesized heteropolysaccharide containing at least about 5% free hydroxyl groups and being free of substituents other than hydroxyl groups that are reactive with acrylic acid.

3,947,393

RESIN COMPOSITION FOR LAMINATES AND PREPARED THEREFROM

Shunichi Sato; Mineaki Tanigaichi, and Kazuyoshi Iwasawa, all of Tokyo, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed July 29, 1974, Ser. No. 492,817

Claims priority, application Japan, July 28, 1973, 48-85115

Int. Cl.² C08L *91/00*

U.S. Cl. 260—19 N **9 Claims**

1. A composition for preparing laminates which comprises,

A. a drying oil-phenols-modified mesitylene-formaldehyde resin, obtained by first reacting a mixture of a mesitylene-formaldehyde resin, phenols and drying-oils in the presence of acid catalyst, followed by reacting the obtained product with formaldehyde in the presence of basic catalyst,

B. a drying oil modified resol type phenolic resin, obtained by first reacting phenols with drying-oils in the presence of acid catalyst, followed by reacting with formaldehyde in the presence of basic catalyst,

C. a resol type water-soluble phenolic resin, obtained by reacting phenols with formaldehyde in the presence of basic catalyst,

wherein the amount of (A) to be mixed is from 5 to 95 parts by weight based on 100 parts of the sum of the amounts of (A) and (B) and the amount of (C) to be mixed is 5 to 45 parts by weight based on 100 parts of the sum of the amounts of (A) and (B).

3,947,394

BONDING POLYESTERS TO RUBBER WITH AN AQUEOUS EMULSION ADHESIVE CONTAINING A ALKALI METAL FREE EMULSIFIER

Edward F. Kalafus, Akron, and Richard M. Wise, Uniontown, both of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 368,558, June 11, 1973, Pat. No. 3,857,730. This application Dec. 23, 1974, Ser. No. 535,867

Int. Cl.² C08L *9/00*

U.S. Cl. 260—23.7 A **6 Claims**

1. A composition useful as an adhesive and consisting essentially of an aqueous alkaline emulsion containing a minor amount by weight of a mixture of a major amount by weight of a rubbery vinyl pyridine copolymer and a minor amount by weight of a heat reactable 2,6-bis(2,4-dihydroxy phenylmethyl)-4-chlorophenol composition, said emulsion being essentially free of alkali metal materials and the emulsifier used in said emulsion being water soluble and being selected from the group consisting of an ammonium sulfate of an aliphatic alcohol, an ammonium phosphate of an aliphatic alcohol, and an ammonium soap of a carboxylic acid and mixtures of the same.

3,947,395

EPOXY SURFACE COATING COMPOSITIONS

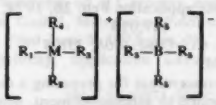
Masatsugu Ogata, and Mikio Sato, both of Hitachi, Japan, assignors to Hitachi, Ltd. and Hitachi Chemical Company, Ltd., both of, Japan

Filed May 7, 1974, Ser. No. 467,794

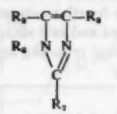
Int. Cl.² C08J *3/20*

U.S. Cl. 260—28 P **12 Claims**

1. A surface coating composition consisting essentially of (a) 100 parts by weight of at least one resinous substance selected from the group consisting of coal tar and asphalt, (b) 10 – 200 parts by weight of an epoxy resin having at least two vicinal epoxy groups in its molecule and (c) 0.01 – 60 parts by weight of at least one salt compound selected from the group consisting of a tetrasubstituted boron salt of an onium ion represented by the formula:



wherein M is N, P or As, R_1, R_2, R_3 and R_4 each are hydrogen, an alkyl, an alkenyl, or an aryl and may be the same or different, and R_5 is phenyl or a substituted phenyl, and a tetrasubstituted boron salt of an imidazolium ion obtained by reacting an acid with an imidazole represented by the formula:



wherein R_6, R_7, R_8 and R_9 each are hydrogen, an alkyl, an alkenyl, an aryl or a cyanoalkyl and may be the same or different, or a derivative thereof to form an imidazolium salt and then reacting the resulting imidazonium salt with a salt of an alkali metal and tetrasubstituted boron having phenyl or a substituted phenyl as a substituent.

3,947,396

COACERVATION OF ANION-CONTAINING AQUEOUS DISPERSE SYSTEMS WITH AMPHOTERIC POLYELECTROLYTES

Donald A. Kangas, and W. Robert Neuendorf, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 248,667, April 28, 1972, Pat. No. 3,843,585. This application Aug. 19, 1974, Ser. No. 498,350

Int. Cl.² C08D *5/02*; **C08F** *47/08*

U.S. Cl. 260—29.3 **13 Claims**

1. An aqueous disperse composition comprising an anionically-stabilized latex, a material coreactive with the latex and an amount of an inherently water-dispersible amphoteric polyelectrolyte to coacervate the composition at a value of pH which is at or below the isoelectric point of the polyelectrolyte and at which value the anionically-stabilized latex contains anions, said polyelectrolyte having an isoelectric point at pH of at least 6 and containing ionizable cationic groups having a pKa in the range from about 4 to about 11 and ionizable

anionic groups having a pKa less than about 6, said polyelectrolyte having a molar ratio of ionizable cationic groups to ionizable anionic groups of at least 1:1, said coreactive material being soluble in water or water-miscible solvents or dispersible in water and containing at least one carbon atom and having at least two substituent groups coreactive with said latex, said substituent groups being selected from the group consisting of methylol groups when attached to a nitrogen atom, modified methylol groups which have been alkylated with an alcohol having from 1 to 4 carbon atoms when such groups are attached to a nitrogen atom, methylol groups when attached to the aromatic ring of a phenolic compound, carboxyl groups, primary amino groups, secondary amino groups and epoxy groups.

3,947,397

AQUEOUS COATING COMPOSITIONS FOR ASBESTOS-CEMENT AND THE LIKE

Ludwig K. Schuster, Dresher, and Singkata Tongyai, Warrington, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 223,320, Feb. 3, 1972, Pat. No. 3,840,392, which is a continuation-in-part of Ser. No. 20,064, March 16, 1970, abandoned, which is a continuation-in-part of Ser. No. 525,663, Feb. 7, 1966, Pat. No. 3,516,847, which is a continuation-in-part of Ser. No. 434,214, Feb. 23, 1965, Pat. No. 3,421,934. This application Feb. 28, 1974, Ser. No. 447,013

Int. Cl.² C08L *9/08, 33/08*

U.S. Cl. 260—29.6 M **9 Claims**

1. In an aqueous concentrate for preparing a curable coating mixture to be applied to asbestos-cement, which concentrate contains a dispersed acrylic or butadienestyrene resin, dispersed pigment in an amount at least one-eighth that of the resin by weight, and a reducing agent for hexavalent chromium, said reducing agent including oxidizable dispersing agent, the improvement according to which the reducing agent, also includes a mixture of sorbitol and lower alkanolamine totaling about one-fourth to about one-half the weight of the pigment, said sorbitol and said alkanolamine each being at least one-third of the total reducing agent.

3,947,398

SURFACING COMPOSITION CONTAINING AQUEOUS RESIN EMULSION AND CALCIUM SULFATE HEMIHYDRATE PLASTER

John Williams, 'Merileys', Fawkham Ave., New Barn, Longfield, Kent, England

Continuation-in-part of Ser. No. 153,793, June 16, 1971, abandoned. This application Aug. 29, 1972, Ser. No. 284,620

Claims priority, application United Kingdom, May 13, 1971, 14656/71; South Africa, May 12, 1972, 72/3241

Int. Cl.² C08L *25/04, 31/04, 33/08, 33/10*

U.S. Cl. 260—29.6 S **14 Claims**

1. A process for making a set composition which comprises providing a composition capable of flowing under its own weight to give a smooth flat surface when applied to a substantially horizontal substrate, said composition consisting essentially of a calcium sulphate alpha-hemihydrate plaster and an aqueous resin emulsion capable of forming a hard continuous resin film on removal of water, said resin being a polymer of an ethylenically unsaturated monomer and having a Rocker hardness of about 10% to about 45% and being in a stable emulsified finely divided form, the relative proportions of the plaster and the resin being such that the plaster takes up the major part of the water in the emulsion when it sets, the proportion of dry resin solids being from 10% to 35% by weight based on the weight of dry plaster solids and the amount of water present being from 15% to 35% by weight based on the weight of dry plaster solids, and allowing said composition to set over a period of time.

3,947,399

AQUEOUS COPOLYMER DISPERSIONS STABLE IN THE ABSENCE OF EMULSIFYING AGENT AND METHOD OF PRODUCING THE SAME BY AQUEOUS POLYMERIZATION OF UNSATURATED MONOMERS IN THE PRESENCE OF TRIHYDRIC OR TETRAHYDRIC ALCOHOL

Kazys Sekmakas, Chicago, Ill., assignor to DeSoto, Inc., Des Plaines, Ill.

Division of Ser. No. 258,890, June 1, 1972. This application July 1, 1974, Ser. No. 484,636

The portion of the term of this patent subsequent to Jan. 21, 1992, has been disclaimed.

Int. Cl.² C08F *2/16, 2/18*

U.S. Cl. 260—29.6 E **8 Claims**

1. An aqueous dispersion of copolymer particles which is stable in the absence of emulsifying agent and which comprises copolymer particles of from about 1 to about 30% by weight of monoethylenic carboxylic acid and at least one copolymerizable monoethylenic monomer, said particles having an average diameter in the range of 0.5–5 microns and said particles containing from 2% up to about 50%, based on the monoethylenic monomers, of trihydric or tetrahydric polyhydric alcohol having a molecular weight up to about 6000, said copolymer particles being at least partially neutralized.

3,947,400

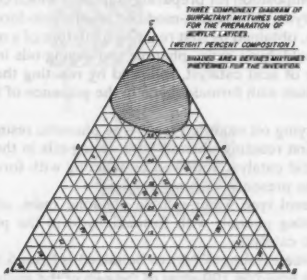
EMULSION POLYMERIZATION OF ACRYLATE OR OTHER VINYL MONOMERS USING SELECTED MIXTURES OF SOLUBLE SALTS OF CERTAIN SULFOSUCCINIC ACID HALF ESTERS

Herbert Burkhard, Eastchester, N.Y.; Nelson Nae-Ching Hsu, and Edward Joseph Fetter, both of Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Apr. 2, 1974, Ser. No. 457,287

Int. Cl.² B01F *17/10*; C08L *23/20*

U.S. Cl. 260—29.6 TA **24 Claims**


THREE COMPONENT DIAGRAM OF SURFACTANT MIXTURES USED FOR THE PREPARATION OF ACRYLIC LATICES.
(WEIGHT PERCENT COMPOSITION)
SHADED AREA DEFINES MIXTURES PREFERRED FOR THE INVENTION.

1. A surfactant mixture of 100 parts by weight consisting of:

from 57 to 87 parts by wt. of a soluble salt of the sulfosuccinate half ester of isodecanol,

from 0 to 30 parts by wt. of a soluble salt of the sulfosuccinate half ester of an alkyl-polyoxyethylene alcohol having the formula,

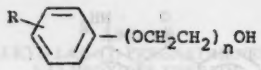
$$R(OCH_2CH_2)_nOH$$

wherein

R is alkyl having 6 to 20 carbon atoms and

n is a value in the range from 2 to 50; and

from 0 to 33 parts by weight of a soluble salt of the sulfosuccinate half ester of a polyethoxyalkylphenol having the formula,



wherein
R is alkyl having 6 to 12 carbon atoms and
n is a value in the range from 2 to 50.

3,947,401

HYDROGELS OF UNSATURATED ESTER COPOLYMERS

Paul Stamberger, Baltimore, Md., assignor to Union Optics Corporation, Verona, Pa.

Division of Ser. No. 186,821, Oct. 5, 1971, Pat. No. 3,758,448. This application July 17, 1973, Ser. No. 380,022

Int. Cl.² C08L *33/08, 33/12, 33/04*

U.S. Cl. 260—29.6 H **13 Claims**

1. A shape-retaining hydrogel consisting essentially of a water-insoluble but water-swellable copolymer of a bulk polymerized monomer mixture consisting essentially of:

A. polymerizable monoester of an ethylenically unsaturated acid selected from the group of acrylic acid, methacrylic acid and mixtures thereof, and an aliphatic saturated polyhydric alcohol having 2 to 6 alcohol groups; and

B. glycidyl ester selected from the group consisting of glycidyl acrylate, glycidyl methacrylate, glycidyl crotonate, and mixtures thereof, and

wherein said monomer mixture contains based upon the total weight of (A) and (B) from about 60 to 99.75% of (A) and from about 0.25 to 40% of (B); and from about 10 to about 90% by weight of an aqueous liquid.

3,947,402

PROCESS FOR THE MANUFACTURE OF POLYIMIDE PRODUCTS

Norbert Vollkommer, and Erich Behr, both of Troisdorf, Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Jan. 26, 1973, Ser. No. 326,617

Claims priority, application Germany, Feb. 1, 1972, 2204532

Int. Cl.² C08G *73/10*

U.S. Cl. 260—30.2 **20 Claims**

1. In a process for the manufacture of a polyimide by the thermal cyclodehydration of a polyamide carboxylic acid, the improvement which comprises carrying out the cyclodehydration in the presence of a nitrogen compound selected from the group consisting of quinoline, isoquinoline, monoalkyl substituted pyridine, dialkyl substituted pyridine, mono aralkyl substituted pyridine, diaralkyl substituted pyridine, mono alkyl substituted quinoline, dialkyl substituted quinoline, mono aralkyl substituted quinoline, diaralkyl substituted quinoline, mono alkyl substituted isoquinoline, dialkyl substituted isoquinoline, mono aralkyl substituted isoquinoline and diaralkyl substituted isoquinoline and mixtures thereof, said polyamide carboxylic acid being the reaction product of a dianhydride of an aromatic tetracarboxylic acid with a mono or polynuclear aromatic diamine, the nitrogen compound being present in an amount between 1 and 200% by weight based upon the solids content of the polyamide carboxylic acid, said process being carried out in the absence of a chemical dehydrating agent.

3,947,403

POLYURETHANE POLYVINYLIDENE CHLORIDE COMPOSITION

John E. McCready, Tallmadge, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 671,982, Oct. 2, 1967, abandoned. This application Aug. 17, 1970, Ser. No. 64,645

Int. Cl.² C08L *75/06*

U.S. Cl. 260—32.8 N **2 Claims**

1. An adhesive composition of matter having improved Scot brittle point comprising a mixture of 5 to 50 parts of a polyvinylidene chloride, which is soluble at 75°F. to the extent of 5 to about 35 parts per hundred parts of methyl ethyl ketone, per hundred parts of a prepolymer formed by the reaction of a polyester polyol of 300 to 6000 molecular weight with sufficient organic polyisocyanate selected from the class consisting of toluene diisocyanate, methylene bis(phenyl isocyanate) and tolidine diisocyanate to give at least about 0.5 to about 10 percent by weight of free isocyanate.

3,947,404

DIHYDRODIGOXIN COMPOUNDS AND THERAPEUTIC COMPOSITIONS

Fritz Kaiser, Lampertheim; Wolfgang Schaumann, Heidelberg; Kurt Stach, Mannheim-Waldhof, and Wolfgang Voigtlander, Viernheim, all of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Germany

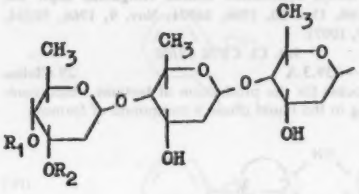
Filed June 5, 1973, Ser. No. 367,312

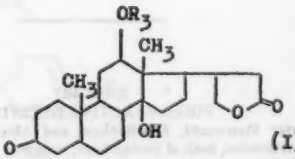
Claims priority, application Germany, July 6, 1972, 2233147

Int. Cl.² C07J *19/00*

U.S. Cl. 260—210.5 **10 Claims**

1. Dihydrodigoxin compound of the formula





(I),

wherein one of R_1 and R_2 represents a methyl or ethyl radical and the other represents hydrogen, methyl, ethyl or acetyl; and R_3 is hydrogen or an acetyl group.

3,947,405
PROCESS FOR MAKING NEOHESPERIDINE DIHYDROCHALCONE

Jost Wild, Uster, and Ulrich Huber, Zurich, both of Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

Filed Dec. 18, 1974, Ser. No. 534,048

Claims priority, application Switzerland, Jan. 3, 1974, 8/74; Nov. 6, 1974, 14840/74

Int. Cl.² C07H *17/04*

U.S. Cl. 260—210 F **8 Claims**

1. A process for the manufacture of neohesperidin dihydrochalcone, which process comprises reacting phloroacetophenone-4′-β-neohesperidoside with isovanillin in the presence of a secondary amine and an organic acid in solution to give neohesperidin or its chalcone and thereafter hydrogenating the reaction product, wherein the secondary amine is a member of the group selected from aliphatic amines such as di(-lower alkyl) amines (e.g. dimethylamine, diethylamine, diisopropylamine etc), aliphatic-aromatic amines such as lower alkylarylamines (e.g. methylphenylamine), diaromatic amines (e.g. diphenylamine etc), alkanolamines (e.g. diethanolamine etc) and, cyclic amines (e.g. morpholine, piperidine, pyrrolidine and piperazine) and wherein the organic acid is a member of the group selected from a carboxylic acid such as a lower alkanecarboxylic acid (e.g. acetic acid, propionic acid etc), formic acid or an aromatic carboxylic acid (e.g. benzoic acid etc).

3,947,406
PROCESS FOR THE PRODUCTION OF LACTAMS

Edwin George Edward Hawkins, Lower Kingswood, England, assignor to BP Chemicals (U.K.) Limited, England

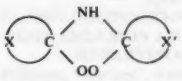
Filed Sept. 12, 1967, Ser. No. 667,061

Claims priority, application United Kingdom, Sept. 24, 1966, 42756/66, Oct. 20, 1966, 46971, Nov. 9, 1966, 50324, Mar. 3, 1967, 10071

Int. Cl. C07d *53/06*

U.S. Cl. 260—239.3 A **29 Claims**

1. The process for the production of lactams which comprises heating in the liquid phase a compound of formula



(IV)

wherein X and X′ are divalent aliphatic moieties of 4 to 11 carbon atoms which may be the same or different, to a temperature in the range of from 40°C to 200°C to decompose it to a lactam.

3,947,407
FIBRE-REACTIVE DYESTUFFS

Dieter Mausezahl, Biel-Benken, and Alexander Wohlkonig, Arlesheim, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

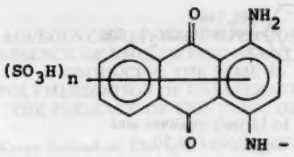
Continuation-in-part of Ser. No. 201,547, Nov. 23, 1971, abandoned. This application Sept. 16, 1974, Ser. No. 506,638

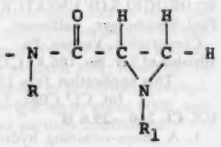
Claims priority, application Switzerland, Nov. 12, 1970, 16743/70

Int. Cl.² C07D *203/12, 203/10, 203/08*

U.S. Cl. 260—239 EQ **1 Claim**

1. An anthraquinone dyestuff of the formula





wherein

n is 1 or 2,

R is hydrogen,

R_1 is hydrogen; C_1-C_5-alkyl; C_1-C_5-alkyl substituted by chlorine, bromine, cyano, hydroxy, C_1-C_4-alkoxy C_1-C_4-alkoxycarbonylamino, di-C_1-C_4-alkylamino, sulfo, phenyl or phenyl substituted by C_1-C_4-alkyl, sulfo or C_1-C_4-alkoxycarbonyl and

Z′ is phenylene, phenylene substituted by sulfo, carboxy or methoxy or diphenylene substituted by sulfo.

3,947,408
PYRROLO-BENZODIAZEPINES, METHOD OF PREPARATION AND METHOD OF USE

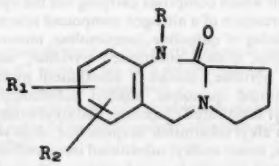
William Blythe Wright, Jr., Woodcliff Lake, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Aug. 5, 1974, Ser. No. 494,657

Int. Cl.² C07D *487/04*

U.S. Cl. 260—239.3 T **6 Claims**

1. A racemic benzodiazepine or an optical isomer thereof of the formula:



wherein R is lower alkyl, allyl, propargyl, trifluoroethyl, cycloalkylmethyl, hydroxyethyl and lower alkoxyethyl; R_1 and R_2 are hydrogen, lower alkyl, chloro, fluoro, bromo, cyano, nitro, amino, trifluoromethyl, methoxy, hydroxy and R_1 and R_2 taken together on adjacent carbon atoms is methylenedioxy and a pharmaceutically acceptable salt thereof.

3,947,409
16-ALKYL-1,4,9-(11)-PREGNATRIENES AND 9,11-EPOXIDES THEREOF

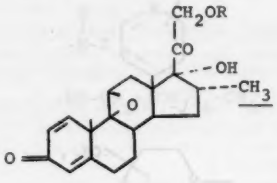
Ralph F. Hirschmann, Scotch Plains, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 106,591, Jan. 14, 1971, which is a continuation of Ser. No. 669,254, Sept. 20, 1967, abandoned, which is a continuation-in-part of Ser. No. 261,812, Feb. 28, 1963, abandoned, which is a continuation-in-part of Ser. No. 742,993, June, 1958, abandoned. This application Oct. 11, 1974, Ser. No. 514,161

Int. Cl.² C07J 7/00, 1/00

U.S. Cl. 260—239.55 R 3 Claims

1. A 16α-methyl-1,4-pregnadiene compound of the formula:



wherein R is from the group consisting of hydrogen and a hydrocarbon carboxylic acid radical having from one to nine carbon atoms.

3,947,410
BIS-OXADIAZOLE COMPOUNDS

Hans-Rudolf Meyer, Binningen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

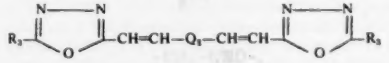
Filed Oct. 17, 1973, Ser. No. 407,117

Claims priority, application Switzerland, Oct. 18, 1972, 15245/72; Oct. 18, 1972, 15246/72

Int. Cl.² C07D 413/10

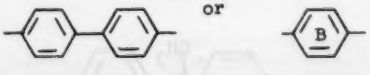
U.S. Cl. 260—240 D 6 Claims

1. A bis-oxadiazole corresponding to the formula (3)



(3)

wherein R_3 is styryl, phenyl, diphenylyl, naphthyl, pyridyl, quinolyl, thienyl-2, furyl-2, 5-phenyl-thienyl-2 or phenyl substituted by halogen, alkyl with 1 to 5 carbon atoms, cycloalkyl with 5 or 6 carbon atoms, alkoxy with 1 to 4 carbon atoms, phenoxy, carboxyl or its salts, carbalkoxy with 2 to 9 carbon atoms, nitrile, methylenedioxy, sulpho groups or their salts, carbamoyl or sulphamoyl which is unsubstituted or substituted at the nitrogen by alkyl with 1 to 6 carbon atoms or phenyl, alkylsulphonyl or alkoxysulphonyl with 1 to 6 carbon atoms, phenylsulphonyl or phenoxysulphonyl unsubstituted or substituted by halogen or alkyl with 1 to 4 carbon atoms, amino, alkanoylamino with 2 to 4 carbon atoms or alkanoyloxy with 2 to 4 carbon atoms; and Q_2 is a radical



wherein the benzene ring is unsubstituted or substituted by halogen, alkoxy with 1 to 4 carbon atoms, a sulpho group or its salts, or sulphamoyl unsubstituted or substituted at the nitrogen by alkyl with 1 to 4 carbon atoms or phenyl.

3,947,411
NOVEL 1-ARYL-2-ARYLALKYL-3-OR-4-[4'-(SUBSTITUTED-ALKYL)PIPERAZINO-1']BUTANOLS-2-OR-BUTENES-1, AND METHODS OF MANUFACTURE THEREOF

Wolf-Dieter Vigelius, Denzlingen, and Spyridon Marinis, Emmendingen, both of Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

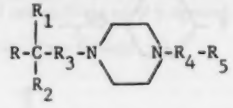
Filed Sept. 18, 1973, Ser. No. 398,513

Claims priority, application Germany, Sept. 21, 1972, 2246279

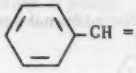
Int. Cl.² C07D 403/06, 241/06

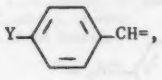
U.S. Cl. 260—240 R 83 Claims

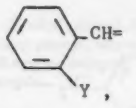
1. A compound of the formula:

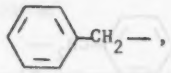


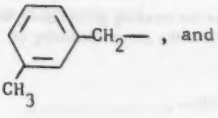
wherein R is a radical selected from the group consisting of:

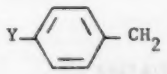




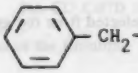


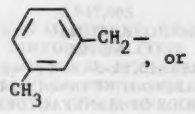


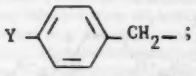




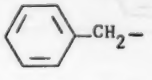
wherein Y is I, Cl, Br, or F; wherein R_1 is —OH, with the proviso that R_1 exists only when R is:




, or


;

wherein R_2 is a radical selected from the group consisting of: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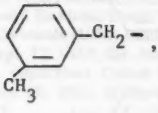
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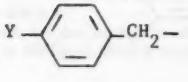
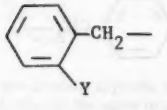

, and



wherein Y has the meaning given above; wherein R_3 is a radical selected from the group consisting of:

$-CH_2-$,

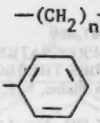
$-CH_2-CH_2-$,

,

and

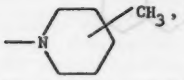
;

wherein R_4 is a radial selected from the group consisting of:


, and

-H,

wherein *n* is an integer from zero to eight; wherein R_5 is a radical selected from the group consisting of: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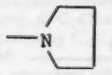
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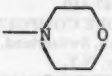
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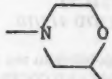
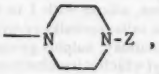

,

-OH,

-Y,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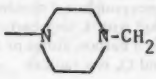
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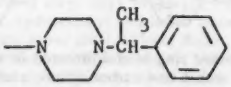
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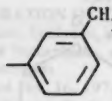

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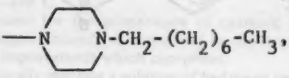

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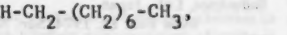

, and

-H,

wherein Y has the meaning given above, and wherein Z is selected from the group consisting of:

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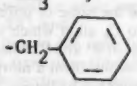

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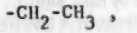

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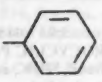

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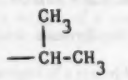


,

-H , and

combinations thereof.

3,947,412
PROCESS FOR THE MANUFACTURE OF 2-ARYL-VIC-TRIAZOLES

Uwe Claussen, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 6, 1973, Ser. No. 413,208

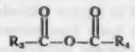
Claims priority, application Germany, Nov. 6, 1972, 2254300; Aug. 1, 1973, 2338881

Int. Cl.² C07D *249/16*

U.S. Cl. 260—240 C **3 Claims**

1. Process for the manufacture of 2-aryl-vic-triazoles which comprises reacting in the presence of copper or an ion of copper an α-oximino-arylhydrazone with a cyclizing agent wherein said aryl is a radical of the benzene, naphthalene, diphenyl, diphenylmethane, diphenylethane, stilbene, tolane, pyridine, triazole, imidazole, pyrazole, coumarin or carbostyril series and said cyclizing agent is selected from the group consisting of:

a. acid anhydride of the formula



wherein R_3 and R_4, independently of each other are C_1–C_4-alkyl, C_1–C_4-alkoxy, or phenyl;

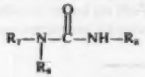
b. isocyanate of the formula

wherein R_5 is hydrogen, C_1–C_8-alkyl, C_5–C_7-cycloalkyl, phenyl, phenylcarbonyl, phenylsulphonyl, C_1–C_8-alkyl substituted by C_1–C_4-alkoxy, or phenyl substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, or nitro;

c. acyl halide of the formula

wherein R_6 is C_1–C_8-alkyl, phenyl, C_1–C_8-alkylamino, phenylamino, substituted phenyl, where the substituent is C_1–C_4-alkyl, C_1–C_4-alkoxy, or halogen;

d. urea of the formula



wherein R_7, R_8, and R_9, independently of each other are hydrogen, C_1–C_4-alkyl, or phenyl;

e. alkali metal salts of cyanic acid; and

f. alkali metal salts of isocyanic acid.

3,947,413
3-α-SUBSTITUTED CEPHALOSPORINS

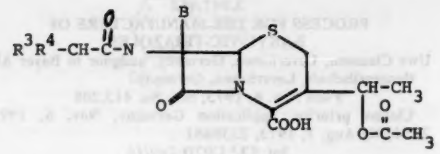
Burton G. Christensen, Scotch Plains, and Ronald W. Ratcliffe, North Plainfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. Nos. 314,485, Dec. 12, 1972, abandoned, and Ser. No. 306,064, Nov. 13, 1972, abandoned. This application Aug. 27, 1973, Ser. No. 392,159

Int. Cl.² C07D *501/24*

U.S. Cl. 260—243 C **2 Claims**

1. A compound of the formula



and the non-toxic pharmaceutically acceptable salts and benzyl ester or alkyl esters of up to 4 carbons thereof wherein R^3 is hydrogen, amino or carboxy, R^4 is phenyl or thienyl and B is hydrogen or methoxy.

3,947,414

CEFAMANDOLE DERIVATIVES

Lowell G. Tensmeyer, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 23, 1974, Ser. No. 535,234

Int. Cl.² C07D *501/20*

U.S. Cl. 260—243 C **8 Claims**

1. A crystalline complex comprising the sodium salt of cefamandole, 1,4-dioxane, and water.

3,947,415

CEFAMANDOLE DERIVATIVES

Lowell G. Tensmeyer, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 23, 1974, Ser. No. 535,235

Int. Cl.² C07D *501/20*

U.S. Cl. 260—243 C **7 Claims**

1. A crystalline complex comprising the sodium salt of cefamandole and L(−) ethyl lactate.

3,947,416

AZAISATOIC ANHYDRIDES

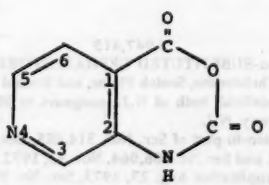
Athelstan L. J. Beckwith, Adelaide, Australia, assignor to The Sherwin-Williams Company, Cleveland, Ohio

Division of Ser. No. 878,552, Nov. 20, 1969, Pat. No. 3,887,550. This application Feb. 10, 1975, Ser. No. 548,443

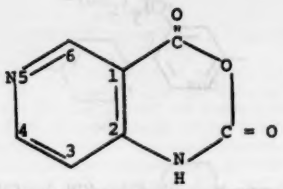
Int. Cl.² C07D *498/04*

U.S. Cl. 260—244 R **2 Claims**

1. 4-azaisatoic anhydride having the formula



2. 5-azaisatoic anhydride having the formula



3,947,417

TRIAZOLOBENZODIAZEPINE DERIVATIVES

Yutaka Kuwada, Hyogo; Hiroyuki Tawada, Osaka, and Kanji Meguro, Hyogo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Japan

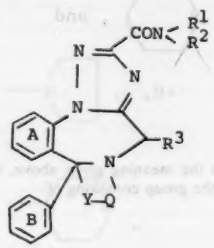
Filed Feb. 19, 1974, Ser. No. 443,528

Claims priority, application Japan, Feb. 19, 1973, 48-19930

Int. Cl.² C07D *487/14, 498/14, 513/14*

U.S. Cl. 260—244 R **13 Claims**

1. A compound of the formula:



wherein R^1 and R^2 are the same or different and each stands for hydrogen or C_1 to C_8 alkyl which is unsubstituted or is substituted by hydroxy; or R^1 and R^2 when taken together with the adjacent nitrogen atom, form a morpholino or N-methylpiperazino ring; R^3 stands for hydrogen; Q stands for ethylene or trimethylene which is unsubstituted or is substituted by C_1 to C_4 alkyl; Y stands for —O—; and rings A and B are unsubstituted or substituted by halo, nitro, C_1 to C_4 alkyl, trifluoromethyl or C_1 to C_4 alkoxy or a pharmaceutically acceptable salt thereof.

3,947,418

HETEROCYCLIC PEROXIDES

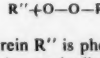
Duane B. Priddy, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 385,914, Aug. 6, 1973, Pat. No. 3,890,316. This application Oct. 4, 1974, Ser. No. 512,283

Int. Cl.² C07D *295/10*

U.S. Cl. 260—246 B **1 Claim**

1. A compound of the formula



wherein R'' is phenylene diisopropylidene,

R is a cycloalkylidene radical of 5–7 carbon atoms,

Y' is a monovalent heterocyclic radical of the group 4-morpholinyl,

1-piperdinyl, and

1-pyrrolidinyl.

3,947,419

PREPARATION OF CYANURIC CHLORIDE

Marinus Alfenaar, Schinnen, and Desiré J. N. Jadoul, Valkenburg, both of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Filed Oct. 16, 1974, Ser. No. 515,255

Claims priority, application Netherlands, Oct. 20, 1973, 7314467

Int. Cl.² C07D *251/28*

U.S. Cl. 260—248 C 3 Claims

1. In a process for the preparation of cyanuric chloride wherein cyanogen chloride is trimerized in the presence of chlorine, the improvement which comprises:

a. electrolytically reacting a solution of hydrogen cyanide or a salt thereof with chloride ion in the anode chamber of an electrolytic cell having separate cathode and anode chambers, the pH in said anode chamber being kept below 4 to form cyanogen chloride;

b. separating said cyanogen chloride from the electrolyzed solution;

c. preparing a mixture of said separated cyanogen chloride with chlorine; and

d. feeding the mixture of cyanogen chloride and chlorine to a trimerization zone wherein said cyanogen chloride is trimerized.

3,947,420

METHOD FOR PRODUCING FOUNDRY MOULDS AND CORES AS WELL AS PRODUCTS THEREBY OBTAINED

Gerard Bardet, Paris, France, assignor to Automatisme et Technique, Arcueil, France

Continuation-in-part of Ser. No. 343,821, March 22, 1973, abandoned. This application May 16, 1974, Ser. No. 470,374

Int. Cl.² C08K *3/36*

U.S. Cl. 260—38 7 Claims

1. A method for producing cores and foundry moulds comprising:

mixing foundry sand, a binder and a low temperature reaction agent in a non-oxidizing atmosphere at a temperature below about 5°C so as to avoid oxidation,

maintaining the mixture in said non-oxidizing atmosphere at said low temperature until it is introduced into a core box,

then introducing said mixture into a core box in the atmosphere to permit oxidation while permitting its temperature to rise above 5°C, and

maintaining the mixture in the core box at a temperature above 5°C in the oxidizing atmosphere to obtain the desired hardness properties and strength before release of the hardened mixture from the core box.

3,947,421

SELF-EXTINGUISHING POLYESTER MOLDING COMPOSITIONS

Wolfgang Seydl, Frankenthal, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Jan. 17, 1974, Ser. No. 434,271

Claims priority, application Germany, Jan. 19, 1973, 2302583

Int. Cl.² C08K *3/34*

U.S. Cl. 260—40 R 4 Claims

1. Self-extinguishing molding compositions based on polybutylene terephthalate, which do not drip flaming particles on exposure to a flame, and which consists essentially of:

A. 3 to 25 percent by weight of a compound containing halogen, which is stable under the conditions of processing the melt;

B. 3 to 15 percent by weight of a synergistically active metal compound; and

C. 1 to 15 percent by weight of a magnesium silicate of the chrysotile type having the composition: 40.1% Slo_2; 40.8% MgO; 0.6% Al_2O_3; 0.2% CaO; 1.7% total iron;

the percentages by weight of components A, B and C being based on the amount of polycondensate used.

3,947,422

LOW PROFILE MOLDING COMPOSITION AND PROCESS FOR MAKING SAME

Sammy Duane Tatum, Clute, and Jerry Marvin Hawkins, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 5, 1974, Ser. No. 494,795

Int. Cl.² C08K *3/40*

U.S. Cl. 260—42.52 13 Claims

1. A reduced viscosity low profile molding composition comprising in combination about 100 parts of a mixture of a terminally unsaturated vinyl ester resin having pendant half ester groups and a copolymerizable monomer, about 0.1 to 5 parts of a viscosity reducing agent, about 5 to 25 parts of a polymeric low profile additive and about 10 to 150 parts of an inert filler; wherein said viscosity reducing agent is a copolymer of a maleic acid half ester of a polyethylene glycol having a weight average molecular weight of about 1450 to 6000 and a monoalkenyl aromatic monomer, said copolymer comprising about 0.5 to 2 moles of the half ester per 100 moles of the aromatic monomer and said copolymer having a weight average molecular weight of from about 15,000 to about 50,000; and wherein said vinyl ester resin is prepared by reacting about equivalent amounts of a polyepoxide and an unsaturated monocarboxylic acid and forming pendant half ester groups by further reaction with a dicarboxylic acid anhydride.

3,947,423

POLYESTERS CONTAINING BICYCLIC PHOSPHATE FLAME RETARDANT

William A. Hills, Trenton, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Division of Ser. No. 368,732, June 11, 1973, Pat. No. 3,849,522. This application May 13, 1974, Ser. No. 469,097

Int. Cl.² C08J *3/20*

U.S. Cl. 260—45.8 R 5 Claims

1. A flame-retardant polyester composition comprising a linear saturated, fiber-forming polyester and from 5 to 25% by weight of bis-((1-oxo-2,6,7-trioxa-1-phosphabicyclo[2.2.2]-oct-4-yl)methyl)2,5-dibromoterephthalate as the flame retardant additive, based on the combined weight of polyester and said flame-retardant additive.

3,947,424

POLYAMIDATION PROCESS

Warren Lee Tomek, Richmond, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed July 31, 1974, Ser. No. 493,395

Int. Cl.² C08G *6/00*

U.S. Cl. 260—45.75 C 5 Claims

1. In a process for the preparation of a synthetic linear fiber-forming polyamide by the melt-polymerization of an aqueous solution of a polyamide-forming salt of an aliphatic diamine and a dicarboxylic acid, the preliminary step of adding to said solution (1) a cupric salt sufficient to provide from 30 to 100 ppm. of copper by weight in the final polymer, (2) from 0.03 to 0.5%, by weight of polymer, of phenylphosphinic acid as a salt, (3) from about 3.5 to about 17 mols potassium bromide per million grams of polymer, and (4) from about 0.7 to 9 mols potassium iodide per million grams of polymer, components (3) and (4) being present in a KBr/KI mol ratio of greater than 0.33 and at a total concentration of 7.5 to 26 mols total halide per million grams of polymer to be produced.

3,947,425

RAPID CURING, HYDROPHILIC RESIN COMPOSITIONS

Harlan G. Freeman; Maurice F. Gillern, both of Seattle, Wash., and Harry A. Smith, Midland, Mich., assignors to Weyerhaeuser Company, Tacoma, Wash.

Division of Ser. No. 256,709, May 25, 1972, abandoned. This application Sept. 13, 1973, Ser. No. 396,670
Int. Cl.² C08G 14/06
U.S. Cl. 260—51.5 31 Claims

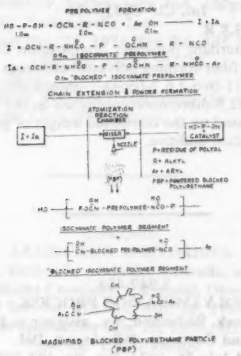
1. A hydrophilic resin composition comprising the reaction product of (a) a resin produced by reacting a ketone-aldehyde prepolymer with a polyhydroxy aromatic compound, the aldehyde:ketone mole ratio in said resin being from 1.5:1 to 6:1 and the polyhydroxy aromatic compound:aldehyde mole ratio in said resin being from 0.2:1 to 5:1, said resin containing substantially no free aldehyde and being free of dominant amide-forming substituents; with (b) an amine salt selection from the hydrochloric, nitric and sulfuric acid salts of m-hydroxy aniline and 2,6-diaminopyridine, the amount of the amine salt being from 0.05 to 2.0 parts by weight per part of said resin.

3,947,426

SOLID PARTICLE-FORM POLYMERIZABLE POLYMERIC MATERIAL AND COMPOSITIONS, STRUCTURES AND METHODS OF EMPLOYING AND PRODUCING THE SAME

Harry L. Lander, Muskegon, Mich., assignor to Story Chemical Corporation, Muskegon, Mich.

Filed Apr. 12, 1974, Ser. No. 460,482
Int. Cl.² C08G 18/80
U.S. Cl. 260—77.5 TB 71 Claims



1. Solid thermoplastic, polymerizable or cross-linkable, multi-functional polymeric material containing blocked isocyanate groups together with urea and/or urethane linkages and wherein the blocked isocyanate groups making up said polymeric material comprise only a portion of the total isocyanate groups employed to produce said polymeric material, said polymeric material upon increase in temperature sufficient to unblock said blocked isocyanate groups being capable of undergoing polymerization or cross-linking.

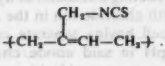
3,947,427

2-(ISOTHIOCYANATOMETHYL)-1,3-BUTADIENE AND POLYMERS THEREOF

Giffin D. Jones, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 303,647, Nov. 3, 1972, abandoned. This application Dec. 16, 1974, Ser. No. 533,104
Int. Cl.² C08G 18/02
U.S. Cl. 260—77.5 R 3 Claims

1. A vinyl addition polymer comprising in interpolymerized form at least 0.5 mole percent of 2-(isothiocyanatomethyl)-1,3-butadiene as a unit of the formula



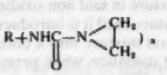
3,947,428

ANIONIC PROCESS FOR THE POLYMERIZATION OF LACTAM

Tadao Matsuo; Shuji Mori, and Yoshiki Morimoto, all of Kobe, Japan, assignors to Mitsuboshi Belting Ltd., Kobe, Japan

Continuation-in-part of Ser. No. 262,847, June 14, 1972, abandoned. This application June 17, 1974, Ser. No. 480,074
Claims priority, application Japan, June 14, 1971, 46-42377
Int. Cl.² C08G 69/20
U.S. Cl. 260—78 L 29 Claims

1. A process for polymerizing ω-lactams to high molecular weight polyamides by heating a mixture of at least one kind of ω-lactam, an anionic catalyst comprising the reaction product of a strong base and an ω-lactam, and an N-substituted ethyleneimine derivative of the general formula



wherein n is 2 or 3 and R represents a divalent or trivalent organic group which has no active hydrogen with an activity higher than the hydrogen of >N—H of the lactam to be polymerized, said N-substituted ethyleneimine derivative being present in an amount of from about 0.01 to about 5.0 mol percent to the amount of said ω-lactam to be polymerized.

3,947,429

METHOD FOR INHIBITING PREMATURE VULCANIZATION OF DIENE RUBBERS

Seiji Sagawa, Hirakata; Tsunehiko Nakagawa, Osaka; Osamu Yoshida, Nishinomiya; Kenjiro Mori, Takarazuka, and Junichi Ebisutani, Neyagawa, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Continuation-in-part of Ser. No. 205,368, Dec. 6, 1971, abandoned. This application Feb. 27, 1974, Ser. No. 446,522
Claims priority, application Japan, Dec. 29, 1970, 45-124425
Int. Cl.² C08F 9/00
U.S. Cl. 260—79.5 B 1 Claim

1. A vulcanizable composition comprising a diene rubber and N-phenylthio-3,5-lupetidine.

3,947,430

COPOLYMERS OF OLEFINS OR OLEFINS AND NON-CONJUGATED DIENES WITH UNSATURATED FURAN AND/OR THIOPHENE DERIVATIVES

Yves Amiard, Pau; Jean -Paul Bellissent, Billere, and Gilbert Marie, Pau, all of France, assignors to Societe Nationale des Petroles Aquitaine, Courbevoie, France

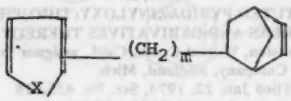
Continuation of Ser. No. 142,368, May 11, 1971, abandoned. This application Mar. 25, 1974, Ser. No. 454,225

Claims priority, application France, May 11, 1970, 70.17017

Int. Cl.[2] C08F *15/02, 27/06;* C08D *1/14*

U.S. Cl. 260—79.5 P 16 Claims

1. A substantially linear high-molecular weight copolymer consisting of non-polar groups derived from at least one alpha-olefin selected from the group consisting of ethylene, propene and 1-butene, and mixtures of ethylene and propene and polar groups derived from at least one member selected from the group consisting of vinyl furan, vinyl thiophene and a compound of the formula



wherein X is selected from the group consisting of oxygen and sulphur and m is a integer from 0 to 12, or a halogenated or alkylated derivative of said member, said copolymer containing from 99.9 to 75% by weight of said non-polar groups and from 0.1 to 25% by weight of said polar group.

3,947,431

COMPOUNDING NITRILE POLYMERS TO REDUCE THE EXTRACTABLE HCN WITH A FORMALDEHYDE COMPOUND

I. Luis Gomez, Longmeadow, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Apr. 24, 1974, Ser. No. 463,441

Int. Cl.[2] C08F *220/42, 220/70, 120/42, 120/70*

U.S. Cl. 260—85.5S 19 Claims

1. In the method for compounding a high nitrile polymer containing from 55 to 85% by weight of a nitrile monomer unit based on the total polymer weight and wherein the weight percent of nitrile monomer is calculated as acrylonitrile, with a formaldehyde compound in order to prepare packaging materials with reduced levels of extractable HCN, the improvement which comprises blending said nitrile polymer with said formaldehyde compound and then purging the blend with a gas having less than 1% of moisture content to reduce the extractable formaldehyde content of packaging material prepared from the blend to below 200 parts per billion.

3,947,432

PROCESS FOR THE PREPARATION OF NOVEL HIGH CHLORINATED BUTYL RUBBER AND VULCANIZABLE COMPOSITION THEREOF

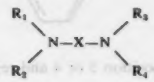
Shozo Tsuchiya, Kawasaki; Yoshikazu Murai, Tamagawa, and Saburo Matubara, Yokohama, all of Japan, assignors to Nippon Oil Company, Tokyo, Japan

Continuation of Ser. No. 257,865, May 30, 1972. This application June 10, 1974, Ser. No. 478,102

Int. Cl. C08d *5/04*

U.S. Cl. 260—79.3 R 8 Claims

1. A process for the preparation of a chlorinated isobutylene-multiolefin copolymer having a multiolefin unit containing 4 to 6 carbon atoms, which comprises contacting a chlorinating agent with a solution of an isobutylene-multiolefin copolymer composed of 80 to 99.5 mol percent of isobutylene units and 20 to 0.5 mol percent of the multiolefin units in an inert organic solvent at a temperature of 0° to 100°C. and in the presence of 0.01 to 10 parts by weight per 100 parts by weight of the copolymer of an aliphatic diamine derivative of the formula



wherein X is an aliphatic hydrocarbon residue of 2 – 6 carbon atoms, and R_1, R_2, R_3 and R_4 are each a member selected from the group of hydrogen and an alkyl group of 1 – 3 carbon atoms, any two of which R_1, R_2, R_3 and R_4 taken together may form an aliphatic hydrocarbon residue of 2 – 6 carbon atoms, said chlorination reaction being carried out to such an extent that from 1.5 to 1.9 chlorine atoms per double bond contained in the copoloymer are introduced into the copolymer.

3,947,433

SUPPORTED CHROMIUM OXIDE CATALYST HAVING MIXED ADJUVANT

Donald R. Witt, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 13, 1974, Ser. No. 469,523

Int. Cl.[2] C08F *4/24, 10/00*

U.S. Cl. 260—88.2 R 18 Claims

1. A process for producing a catalyst comprising: activating a supported chromium oxide at a temperature within the range of 500°–2,000°F; thereafter treating said thus-activated supported chromium oxide with from 0.5 to 10 weight percent, based on the weight of said supported chromium oxide, of a hydrocarbyl aluminum hydrocarbyloxide and from 0.5 to 10 weight percent, based on the weight of said supported chromium oxide of an organoboron compound.

3,947,434

9-(p-PHENYLAZOANILINO)-7-METHYL-1H-IMIDAZO[4,5-f]QUINOLINES

Claude F. Spencer, and Harry R. Snyder, Jr., both of Norwich, N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Division of Ser. No. 367,501, June 6, 1973, Pat. No. 3,919,238. This application Mar. 26, 1975, Ser. No. 562,172

Int. Cl.[2] C07C *107/06*

U.S. Cl. 260—155 1 Claim

1. The compound 9-(p-phenylazoanilino)-7-methyl-1H-imidazo[4,5-f]quinoline.

3,947,435
DISAZO ACID COMPOUNDS CONTAINING ONE SULPHONIC ACID GROUP AND ONE PHOSPHONIC OR METHYL-PHOSPHINIC ACID GROUP

Jacques Pierre Edmond Pechmeze, Paris; Robert Frederic Michel Sureau, Enghien les Bains, and Claude Marie Henri Emile Brouard, Sotteville les Rouen, all of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

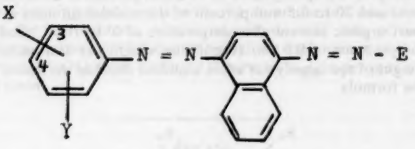
Filed Nov. 13, 1973, Ser. No. 415,474

Claims priority, application France, Nov. 13, 1972, 72.40114

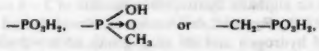
Int. Cl.² C09B *31/04*

U.S. Cl. 260—190 **7 Claims**

1. A disazo compound of the formula:



in which X is fixed in position 3 or 4 and represents



Y represents hydrogen, chlorine, methoxy or nitro and E is N-ethyl-N-(m or p-sulphobenzyl)-4-amino-phenyl or 4-phenyl-amino-5-sulpho-naphthyl(1).

3,947,436
SULFUR CONTAINING ORGANO-ORGANOOXYSILANE

Gottfried Rocktaschel; Friedrich Thurn; Horst Fleischhauer, all of Grossauheim; Werner Schwarze, Frankfurt am Main, and Hermann Westlinning, Kleinostheim, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

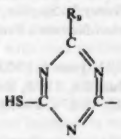
Continuation-in-part of Ser. No. 163,467, July 16, 1971, Pat. No. 3,798,196. This application Mar. 14, 1974, Ser. No. 451,290

Claims priority, application Germany, July 18, 1970, 2035778

Int. Cl.² C07D *251/46*, *251/38*

U.S. Cl. 260—249.5 **14 Claims**

1. A compound having the formula R-S-X-Z where R is the heterocyclic group



where R_9 is hydrogen,

and R_2 and R_3 are hydrogen or a lower alkyl, X is an alkylene group having at least 3 carbon atoms in the main chain and not over 18 carbon atoms and Z is $SiR''(OR')_2$; $Si(OR')_3$; $-Si(OR')_2-O-Si(OR')_3$; or $Si(OR')_2-O-Si(OR')_2-X-R$ where R' and R'' are alkyl of 1 to 12 carbon atoms.

3,947,437
SUBSTITUTED PYRIDAZINYLOXY(THIO)PHENYL UREAS AND DERIVATIVES THEREOF

Howard Johnston, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 22, 1974, Ser. No. 435,618

Int. Cl.² C07D *237/00*

U.S. Cl. 260—250 A **1 Claim**

1. N'-(4-((6-chloro-3-pyrazinyl)oxy)phenyl)-N,N-dimethylurea.

3,947,438
DECARBONYLATION OF QUINOXALINES

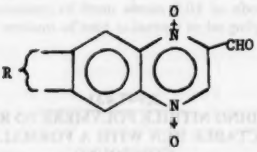
Robert F. Myers, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Oct. 15, 1974, Ser. No. 514,451

Int. Cl.² C07D *241/52*

U.S. Cl. 260—250 QN **6 Claims**

1. A process which comprises subjecting an aldehyde having the formula



where

R is in either of the indicated positions and is hydrogen, alkyl, having up to four carbons, alkoxy having up to four carbons, alkylthio having up to four carbons, alkylsulfinyl having up to four carbons, alkylsulfonyl having up to four carbons, fluoro, chloro, bromo, cyano, trifluoromethyl, alkanoyl having two to four carbons, $CONR^1R^2$ or $SO_2NR^1R^2$, R^1 and R^2 being separately selected from the class consisting of hydrogen and alkyl having up to three carbons,

in liquid condition to the action of at least 0.5 molar equivalents of an unhindered secondary amine having a pK_a greater than about 8, at a temperature of from about 30° to about 150°C., to decarbonylate the CHO group and form the corresponding decarbonylated product.

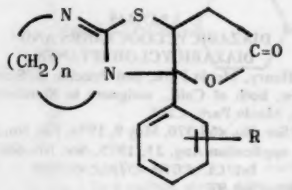
3,947,439

4-HYDROXY-4-PHENYL-2,3-CYCLOALKYLIMINO-2-THIAZOLIDINEALKYLCARBOXYLIC ACID LACTONES

Peter H. L. Wei, Springfield, and Stanley C. Bell, Penn Valley, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 346,495, March 30, 1973, abandoned. This application Nov. 14, 1974, Ser. No. 523,762
The portion of the term of this patent subsequent to Dec. 10, 1991, has been disclaimed.
Int. Cl.² C07D 513/14
U.S. Cl. 260—251 A 3 Claims

1. A compound of the formula:



wherein R is hydrogen, chloro, bromo, iodo, nitro, trifluoromethyl, or alkoxy, said alkyl or alkoxy groups having from 1 to 4 carbons; and *n* is 2, 3, or 4; and the non-toxic pharmaceutically acceptable acid addition salts thereof.

3,947,440

MANUFACTURE OF 2-(ALKYL)AMINO-4-HYDROXY-5-ALKYLPYRIMIDINES

Albert Edward Kaye, and Alan Cyril Tucker, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jan. 2, 1974, Ser. No. 429,808
Claims priority, application United Kingdom, Jan. 4, 1973, 491/73
Int. Cl.² C07D 239/34
U.S. Cl. 260—256.4 C 8 Claims

1. A process for the manufacture of 2-amino-2-alkylamino- or 2-dialkylamino-4-hydroxy-5-alkylpyrimidines comprising the step of reacting 2-amino-, 2-alkylamino- or 2-dialkylamino-4-hydroxy-pyrimidine wherein the alkyl group or groups on the 2-amino group have not more than six carbon atoms with an aldehyde of the formula R.CHO wherein R is a hydrogen atom, alkyl having not more than five carbon atoms, alkenyl of 2 to 4 carbon atoms or phenyl in presence of hydrogen and a supported palladium hydrogenation catalyst.

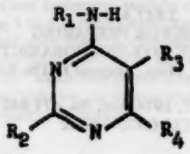
3,947,441

SUBSTITUTED 2-AMINO-4-(HYDROXYAMINO)-PYRIMIDINES

Ernst Schweizer, Basel; Jörg Frei, Schonenbuch, and Atso Ilvespää, Allschwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 20, 1974, Ser. No. 498,906
Claims priority, application Switzerland, Aug. 24, 1973, 12198/73; July 10, 1974, 9507/74
Int. Cl.² C07D 239/42
U.S. Cl. 260—256.4 N 8 Claims

1. A pyrimidine of the formula I



(I)

wherein

R_1 represents hydroxy, benzyloxy or tetrahydropyran-2-yloxy,

R_2 represents amino or,

R_3 represents phenyl, benzyl, phenyl or benzyl which are mono-or trisubstituted by a member selected from the group consisting of chlorine and methoxy,

R_4 represents hydrogen, methyl, or ethyl and their pharmaceutically acceptable addition salts with inorganic and organic acids.

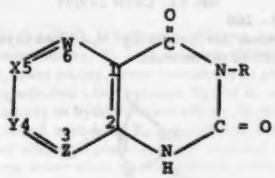
3,947,442

METHOD FOR PRODUCING HETEROCYCLIC ACID ANHYDRIDES AND PYRIMIDINEDIONES

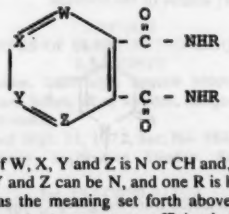
Athelstan L. J. Beckwith, Adelaide, Australia, assignor to The Sherwin-Williams Company, Cleveland, Ohio

Division of Ser. No. 878,552, Nov. 20, 1969, Pat. No. 3,887,550. This application Feb. 10, 1975, Ser. No. 548,442
Int. Cl.² C07D 239/96, 475/02, 487/04
U.S. Cl. 260—256.4 F 5 Claims

1. A method for producing a pyrimidinedione having the formula,



wherein each of W, X, Y and Z is N or CH and, not more than two of W, X, Y and Z can be N, and R is hydrogen or an alkyl group having not more than 8 carbon atoms, said method comprising dissolving in an inert anhydrous solvent substantially equivalent amounts of lead tetraacetate and a compound having the formula



wherein each of W, X, Y and Z is N or CH and, not more than two of W, X, Y and Z can be N, and one R is hydrogen while the other R has the meaning set forth above, agitating the reaction mixture at a temperature sufficiently high that reaction occurs and recovering the pyrimidinedione.

3,947,443
PROCESS FOR PREPARING 1,3-BIS(HALOMETHYL)PHENOBARBITALS

Julius A. Vida, Billerica, Mass., assignor to The Kendall Company, Walpole, Mass.

Filed May 17, 1974, Ser. No. 471,042
Int. Cl.² C07D 239/62
U.S. Cl. 260—257 **8 Claims**

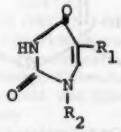
1. A process for preparing 1,3-bis(chloromethyl) phenobarbital or 1,3bis-(bromomethyl) phenobarbital comprising the step of reacting phenobarbital with formaldehyde and a chlorine source or a bromine source selected from the group consisting of hydrochloric acid, hydrobromic acid, and acyl chlorides and bromides selected from the group consisting of acetyl chloride, acetyl bromide, propionyl chloride, butyryl chloride, chloroacetyl chloride, benzoyl chloride, phthaloyl chloride and mixtures of any of the above compounds at a temperature of −10° to 200°C in the presence of a Lewis acid catalyst, the formaldehyde and bromine or chlorine source being employed in at least approximately twice the molar amounts of phenobarbital.

3,947,444
PROCESS FOR PRODUCING N_1-(DIHYDROXYALKYL)-5-SUBSTITUTED URACILS

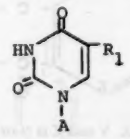
Solomon Aronovich Giller, ulitsa Pernavas, 10, kv. 76; Regina Abramovna Zhuk, ulitsa Gorkogo, 77, kv. 20; Anna Eduardovna Berzinya, ulitsa Raunas 35/2, kv. 29, and Laima Avgustovna Sherinya, ulitsa Rainas, 43, kv. 43, all of Riga, U.S.S.R.

Filed June 21, 1973, Ser. No. 372,419
Int. Cl.² C07D 239/54
U.S. Cl. 260—260 **5 Claims**

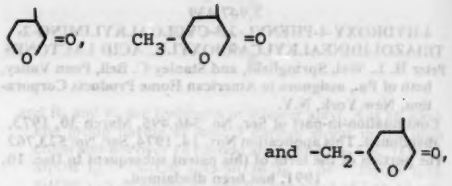
1. A process for producing N_1-(dihydroxyalkyl)-5-substituted uracils of the formula:



where R_1 is selected from the group consisting of hydrogen, methyl, trifluoromethyl and fluorine; R_2 is selected from the group consisting of 1,4-dihydroxybutyl-2,1,4-dihydroxypentyl-2, and 2,5-dihydroxypentyl-1, comprising reducing N_1-(butyrolactone) uracils of the formula:



wherein R_1 is selected from the group consisting of hydrogen, methyl, trifluoromethyl and fluorine; and A is selected from the group consisting of



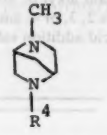
with an alkali metal boron hydride in an aqueous or aqua-alcoholic solution at a temperature ranging from 15° to 50°C.

3,947,445
DIAZABICYCLOOCTANES AND DIAZABICYCLOHEPTANES

David W. Henry, Menlo Park, and Priscilla A. Sturm, Mountain View, both of Calif., assignors to Stanford Research Institute, Menlo Park, Calif.

Division of Ser. No. 468,370, May 9, 1974, Pat. No. 3,905,979. This application Aug. 21, 1975, Ser. No. 606,412
Int. Cl.² C07D 451/02, 487/08
U.S. Cl. 260—268 BF **3 Claims**

1. A compound having the structure



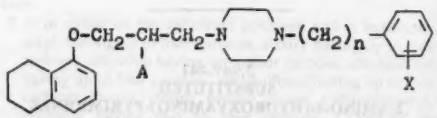
wherein R^4 represents $—CON(C_2H_5)_2$ or $—COOC_2H_5$; together with the acid addition salts of said compounds.

3,947,446
NOVEL 1-[3-(5,6,7,8-TETRAHYDRONAPHTH-1-YLOXY)-ROPYL]-PIPERAZINE COMPOUNDS AND THERAPEUTIC COMPOSITIONS

Ernst-Christian Witte, Mannheim; Kurt Stach, Mannheim-Waldhof; Karl Dietmann, Mannheim-Vogelstang, and Gisbert Sponer, Mannheim-Waldhof, all of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Germany

Filed June 14, 1973, Ser. No. 370,068
Claims priority, application Germany, July 20, 1972, 2235597
Int. Cl.² C07D 295/12
U.S. Cl. 260—268 BC **16 Claims**

1. 1-[3-(5,6,7,8-Tetrahydronaphth-1-yloxy)-propyl]-piperazine compound of the formula



wherein

A is hydrogen or hydroxyl;

X is hydrogen, chlorine, alkyl, alkoxy, alkylthio, trifluoromethyl, nitro, amino or alkanoylamino; wherein the alkyl moieties in X contain up to 6 carbon atoms; and

n is 0 or 1;

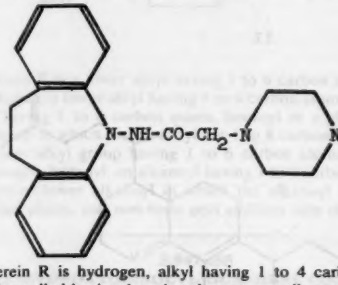
or the pharmacologically compatible acid addition salts thereof.

3,947,447
5H-AMINOACETAMIDO-10,11-DIHYDRODIBENZ-[b,f]AZEPINES AND IMMEDIATE PRECURSORS

Edward J. Glamkowski, Warren, N.J., assignor to American Hoechst Corporation, Bridgewater, N.J.

Filed May 20, 1974, Ser. No. 471,890
Int. Cl.² C07D *223/18, 295/06*
U.S. Cl. 260—268 TR 7 Claims

1. A compound of the formula



wherein R is hydrogen, alkyl having 1 to 4 carbon atoms, hydroxyalkyl having 1 to 4 carbon atoms, alkoxyalkyl having 2 to 5 carbon atoms, phenylalkyl having 7 to 9 carbon atoms, acetoxyalkyl having 3 to 5 carbon atoms, phenyl, chlorophenyl, methoxyphenyl, or trifluoromethylphenyl; and the physiologically tolerable acid addition salts thereof.

3,947,448
SALTS OF NOVEL p-DIHYDROXYBENEZENE DISULFONIC ACIDS

Antonio Esteve-Subirana, Barcelona, Spain, assignor to Laboratorios Del Dr. Esteve SA, Barcelona, Spain

Continuation-in-part of Ser. No. 359,771, May 14, 1973, abandoned. This application Dec. 26, 1973, Ser. No. 427,679
Claims priority, application Switzerland, May 17, 1972, 7326/72; Jan. 26, 1973, 1154/73
Int. Cl.² C07D *295/22*
U.S. Cl. 260—268 R 8 Claims

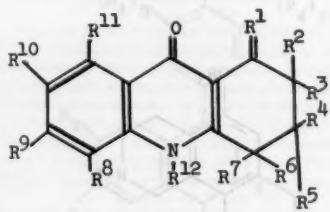
5. bis (piperazine) p-dihydroxy benzene disulfonate.

3,947,449
TETRAHYDROACRIDONES HAVING CHEMOTHERAPEUTIC ACTION AND PROCESS FOR PREPARING THEM

Walter Dürckheimer, Hattersheim, Main; Wolfgang Raether, Dreieichenhain, and Hubert Georg Seliger, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed July 22, 1974, Ser. No. 490,652
Claims priority, application Germany, July 24, 1973, 2337474
Int. Cl.² C07D *219/06;* A61K *31/47*
U.S. Cl. 260—279 R 16 Claims

1. A tetrahydroacridone of the formula



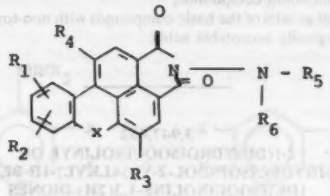
and salts thereof with physiologically tolerated acids and bases, wherein R^1 is oxygen; R^2 – R^7, which may be the same or different are hydrogen, straight-chain or branched lower alkyl having 1 to 4 carbon atoms, phenyl, or phenyl mono- or di-substituted with fluorine, chlorine, or trifluoromethyl, except that only one of R^2 – R^7 is phenyl or substituted phenyl; R^8, R^9, and R^{11}, which may be the same or different, are hydrogen, fluorine, chlorine, or trifluoromethyl; R^{10} is chlorine; and R^{12} is hydrogen or hydroxy.

3,947,450
BENZOXANTHENE AND BENZOTHIOXANTHENE DICARBOXYLIC ACID IMIDE DYESTUFFS AND PROCESS FOR THEIR MANUFACTURE

Otto Fuchs, Frankfurt am Main, and Helmut Tröster, Konigstein, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation-in-part of Ser. No. 328,770, Feb. 1, 1973, abandoned, which is a division of Ser. No. 133,755, April 13, 1971, Pat. No. 3,748,330. This application June 18, 1974, Ser. No. 480,368
Claims priority, application Germany, Apr. 14, 1970, 2017763
The portion of the term of this patent subsequent to June 26, 1990, has been disclaimed.
Int. Cl.² C07D *491/06, 516/06*
U.S. Cl. 260—281 Z 7 Claims

1. A benzoxanthene- or benzothioxanthene- dicarboxylic acid amino-imide dyestuff of the formula



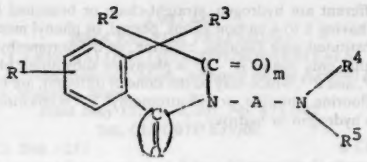
wherein X is O or S, R_1 is hydrogen, chlorine, bromine, lower alkyl or lower alkoxy, R_2 is hydrogen, chlorine, bromine, lower alkyl, lower alkoxy, lower carbalkoxy or phenyl, R_1 and R_2 not being adjacent t.butyl groups, R_3 and R_4 each is hydrogen, lower alkoxy or hydroxy lower alkoxy, R_5 is hydrogen or, when R_6 is acetyl, acetyl and R_6 is cyclohexyl, lower alkanoyl, phenyl lower alkanoyl, phenoxy lower alkanoyl, cyano lower alkyl, hydroxy lower alkyl, phenyl sulfonyl, benzoyl, dichlorobenzoyl, sulfonamido-benzoyl, carbonamido-benzoyl, sulfonamido-dichlorobenzoyl, lower alkyl-sulfonamidobenzoyl or sulfonamido-benzimidazolyl.

3,947,451
DERIVATIVES OF SUBSTITUTED ISOQUINOLINE 1,3-DIONES

Nils Åke Jönsson, Sodertalje; Lembit Mikiver, Jarna, and Pinchas Moses, Solna, all of Sweden, assignors to AB Kabi, Stockholm, Sweden

Filed Sept. 11, 1972, Ser. No. 288,027
Claims priority, application Sweden, Sept. 16, 1971, 11742/71
Int. Cl.² C07D *217/24*
U.S. Cl. 260—281 R 22 Claims

1. A compound of the formula



in which

m and *n* are each one, A is an ethylene or trimethylene group or such a group having a methyl substituent or A signifies an acetyl group or such a group having an α-alkyl substituent having 1-4 carbon atoms, connected to the group

by the carbonyl CO linkage,

R^1 is hydrogen, halogen or a nitro group,

R^2 and R^3 are saturated normal alkyl groups of up to 6 carbon atoms, or allyl or propargyl or taken together with the carbon atom to which they are bonded form a lower saturated carbocyclic ring, R^4 and R^5 are hydrogen or alkyl groups of at most 6 carbon atoms, or R^4 and R^5 together with the nitrogen form a pyrrolidine or a piperidine ring,

and, in case A is such an ethylene or trimethylene group, the corresponding amine oxides and quarternary lower alkyl ammonium compounds,

as well as salts of the basic compounds with non-toxic physiologically acceptable acids.

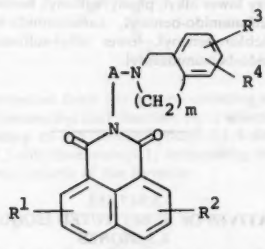
3,947,452

2-[(DIHYDROISOQUINOLINYL OR DIHYDROISOINDOL-2-YL)ALKYL]-1H-BENZ-[DE]ISOQUINOLINE-1,3(2H)-DIONES

Peter C. Wade, Pennington, N.J., and Berthold Richard Vogt, Yardley, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jan. 6, 1975, Ser. No. 538,976
Int. Cl.² C07D 401/06, 217/24
U.S. Cl. 260—281 NH **17 Claims**

1. A compound of the formula:



wherein R^1, R^2, R^3, and R^4 are each independently selected from the group consisting of hydrogen, halogen, lower alkyl of 1 to 4 carabons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, nitro, cyano, amino, and trifluoromethyl; A is a straight or branched chain alkylene of 1 to 8 carbons; and *m* is 1 or 2; and a pharmaceutically acceptable acid addition salt therof.

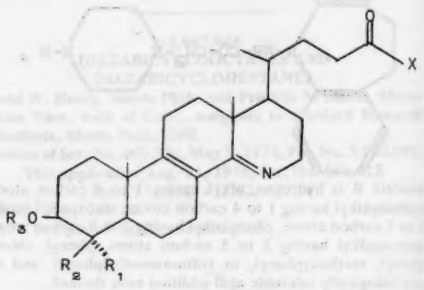
3,947,453

24-OXO-14a-AZA-d-HOMO-CHOLESTADIENE DERIVATIVES

Charles D. Jones, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Sept. 6, 1974, Ser. No. 503,565
Int. Cl.² C07D 215/06
U.S. Cl. 260—287 AZ **10 Claims**

1. The compound of the formula



wherein:

R_1 and R_2 are both hydrogen or both methyl;

R_3 is hydrogen or C_1–C_4 alkanoyl;

X is halogen, NR_5R_6, or OR_6, wherein R_5 and R_6 independently are hydrogen or C_1–C_4 alkyl; R_6 is hydrogen, C_1–C_4 alkyl, or an alkali metal cation;

and the pharmaceutically acceptable salts thereof.

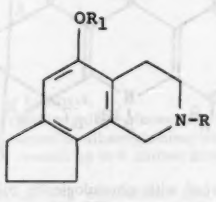
3,947,454

5 OR 1'-HYDROXY-2-ALKYL-7,8-CYCLOPENTANO[h]-1,2,3,4-TETRAHYDROISOQUINOLINES AND ESTERS

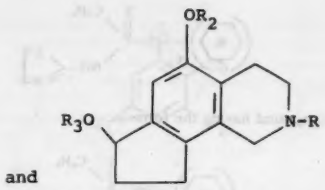
Ian William Mathison; William Ebenezer Solomons, both of Memphis, Tenn., and Raymond Henry Jones, Northport, N.Y., assignors to Marion Laboratories, Inc., Kansas City, Mo.

Filed Mar. 28, 1974, Ser. No. 455,672
Int. Cl.² C07D 217/00
U.S. Cl. 260—287 CF **11 Claims**

1. A compound of the formulas



I



and

II

wherein R is a lower alkyl having 1 to 6 carbon atoms, R_1 is hydrogen, a lower alkyl having 1 to 6 carbon atoms, an alkanoyl having 1 to 8 carbon atoms, benzoyl or a phenyl-lower alkanoyl in which the alkanoyl has 1 to 8 carbon atoms, R_2 is a lower alkyl group having 1 to 6 carbon atoms and R_3 is hydrogen, benzoyl, an alkanoyl having 1 to 8 carbon atoms or a phenyl-lower alkanoyl in which the alkanoyl has 1 to 8 carbon atoms, and non-toxic acid addition salts thereof.

3,947,455

5'-(8'-HYDROXYQUINOLYL)GUANIDINE COMPOUNDS

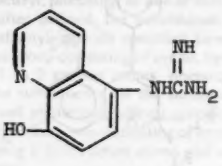
John Lawrence Hughes, and Robert Chung-Huan Liu, both of Kankakee, Ill., assignors to Armour Pharmaceutical Company, Phoenix, Ariz.

Continuation-in-part of Ser. No. 460,815, April 15, 1974, Pat. No. 3,908,013, which is a division of Ser. No. 73,244, Sept. 17, 1970, abandoned. This application Oct. 29, 1974, Ser. No. 518,675

Int. Cl.² C07D *215/38*

U.S. Cl. 260—288 R **1 Claim**

1. Aromatic guanidine compound having the formula



3,947,456

SUBSTITUTED 4-PHENYL ISOQUINOLINES

Alfred Rheiner, Basel, Switzerland, assignor to Hoffman-La Roche Inc., Nutley, N.J.

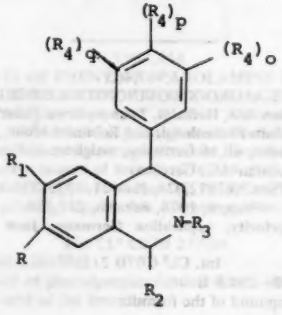
Division of Ser. No. 102,551, Dec. 29, 1970, abandoned. This application June 1, 1973, Ser. No. 365,921

Claims priority, application Switzerland, Jan. 6, 1970, 103/70

Int. Cl.² C07D *217/24*

U.S. Cl. 260—289 R **14 Claims**

1. A compound of the formula



wherein R signifies hydroxy or lower alkoxy, R_1 signifies hydrogen, R_2 signifies hydrogen, R_3 signifies lower alkyl, R_4 signifies chlorine and *o*, *p* and *q* are the integers 0 or 1, wherein one or two of the characters *o*, *p* or *q* is the integer 0.

3,947,457

METHOD FOR PREPARING 2,5-DIHALO- AND 2,5,6-TRIHALOPYRIDINES

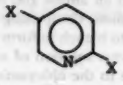
Stanley D. McGregor, and Herman O. Senkbeil, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 27, 1974, Ser. No. 537,055

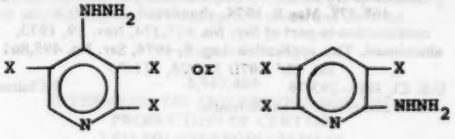
Int. Cl.² C07D *213/02*

U.S. Cl. 260—290 HL **11 Claims**

1. A method for preparing 2,5-dihalopyridine corresponding to the formula:



wherein each X independently represents chloro, fluoro or bromo which comprises reacting at a temperature of from about 50°C to the reflux temperature a halohydrazinopyridine of one of the formulas



with an aqueous alkali metal hydroxide in the presence of a reaction medium selected from the group consisting of lower-alkanols of 1 to 4 carbon atoms and loweralkylglycols of 1 to 4 carbon atoms.

3,947,458

PREPARATION OF AMINES

Abul F. M. Iqbal, Glattbrugg, Switzerland, assignor to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 207,629, Dec. 13, 1971, abandoned. This application Jan. 28, 1974, Ser. No. 437,408

Claims priority, application Switzerland, Dec. 22, 1970, 19166/70

Int. Cl.² C07D *211/06*

U.S. Cl. 260—293.51 **5 Claims**

1. In an improved process for the preparation of amine by the catalytic reaction of (1) a nitrogen compound selected from the group consisting of ammonia, ammonium formate, N-methylprrolidine, pyrrolidine, methylamine, dimethylamine, piperidine, N-methylpiperidine, aminomethylcyclohexane, cyclohexylamine, and pyridine, (2) olefin selected from the group consisting of ethylene, cyclohexene, octene dodecene, norbornene and tetradecene, (3) carbon monoxide and

(4) water, the improvement which comprises the step of effecting the reaction in the presence of iron pentacarbonyl and a rhodium compound selected from the group consisting of rhodium oxide, rhodium hydroxide, rhodium acetate, rhodium carbonyl, rhodium chloride, tris(triphenylphosphine)rhodium chloride, and rhodium carbonyl chloride, the iron pentacarbonyl being present at 0.5-5 mol % based on the olefin, and the ratio of iron pentacarbonyl to rhodium compound being from 10:1 to 100:1.

3,947,459

AQUEOUS PREPARATION OF SULFENAMIDES

Penelope R. Pappas, Akron, and Dane K. Parker, Canton, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 4, 1974, Ser. No. 512,807
Int. Cl.² C07D 417/12
U.S. Cl. 260—293.57 **23 Claims**

1. An improved process for the preparation of sulfenamides by combining an aqueous solution of an alkali metal salt of a mercaptothiazole with an amine and bleach and reacting the mixture, the improvement comprising
   a. adding an amine to bleach to form a chloramine mixture,
   b. adding the aqueous solution of an alkali metal salt of a mercaptothiazole to the chloramine mixture,
   c. allowing the reaction to take place, and
   d. separating and water-washing the sulfenamide.

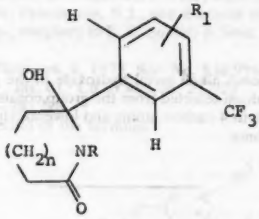
3,947,460

5-HYDROXY-5-SUBSTITUTED PHENYL-PYRROLIDONES AND PIPERIDINONES

William J. Houlihan, Mountain Lakes, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 483,552, June 27, 1974, abandoned, which is a continuation-in-part of Ser. No. 468,377, May 9, 1974, abandoned, which is a continuation-in-part of Ser. No. 417,374, Nov. 19, 1973, abandoned. This application Aug. 8, 1974, Ser. No. 495,861
Int. Cl.² C07D 207/26, 211/76
U.S. Cl. 260—293.76 **5 Claims**

1. A compound of the formula:



where
R is hydrogen or lower alkyl having 1 to 4 carbon atoms,
R_1 is hydrogen or halo having an atomic weight of about 19 to 36, and
n is 0 or 1.

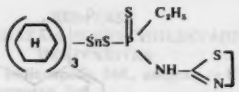
3,947,461

ORGANOTIN MITICIDAL AND INSECTICIDAL COMPOUNDS

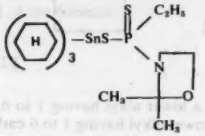
Don R. Baker, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 304,871, Oct. 19, 1972, Pat. No. 3,832,370. This application May 6, 1974, Ser. No. 466,928
Int. Cl.² C07F 9/65, 7/22
U.S. Cl. 260—299 **2 Claims**

1. A compound having the formula:



2. A compound having the formula:



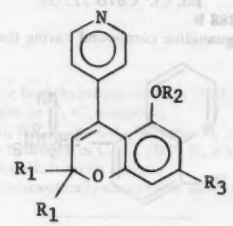
3,947,462

2,4,7-SUBSTITUTED 5-HYDROXY BENZOPYRANS AND ESTERS

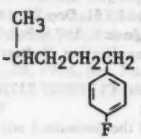
David Lloyd Arendsen, Libertyville, and Martin Winn, Deerfield, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed May 22, 1974, Ser. No. 472,243
Int. Cl.² C07D 311/60
U.S. Cl. 260—295 F **5 Claims**

1. A compound of the formula



wherein each R_1 is loweralkyl, R_2 is hydrogen or loweralkanoyl and R_3 is



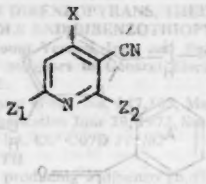
3,947,463

CERTAIN 2-AMINO-NICOTINONITRILE DERIVATIVES

Erwin Fleckenstein, Hofheim, Taunus; Ernst Heinrich, Frankfurt am Main-Fechenheim, and Reinhard Mohr, Offenbach-Rumpenheim, all of Germany, assignors to Cassella Farbwerke Mainkur AG, Germany

Division of Ser. No. 372,024, June 21, 1973. This application Nov. 6, 1974, Ser. No. 521,530
Claims priority, application Germany, June 22, 1972, 2230392
Int. Cl.² C07D 213/57
U.S. Cl. 260—294.8 G **14 Claims**

1. A compound of the formula



wherein X is alkyl having 1 to 6 carbon atoms, alkenyl having 2 to 6 carbon atoms, cycloalkyl having 3 to 8 carbon atoms, phenyl, benzyl, phenethyl, one of said radicals substituted as hereinafter defined or hydrogen; Z_1 is

—NH—OR_{10} or

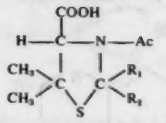
and Z_2 is mercapto, —SR_{12} or —SO_2R_{12}; R_5 and R_6 are alkyl having 1 to 6 carbon atoms, cycloalkyl having 3 to 8 carbon atoms, phenyl, benzyl, phenethyl, one of said radicals substituted as hereinafter defined or hydrogen; R_{10} is alkyl having 1 to 6 carbon atoms, benzyl, phenethyl, one of said groups substituted as hereinafter defined or hydrogen; R_{11} is alkyl having 1 to 6 carbon atoms or said alkyl substituted as hereinafter defined; R_{12} is alkyl having 1 to 6 carbon atoms, alkenyl having 2 to 6 carbon atoms, cycloalkyl having 3 to 8 carbon atoms, phenyl, benzyl, phenethyl or one of said radicals substituted as hereinafter defined, the substituents for the substituted alkyl or alkenyl radicals specified hereinabove being selected from the group consisting of cyano, hydroxy, acetoxy, alkoxy having 1 to 2 carbon atoms, phenoxy and phenoxyacetoxy and the substituents for the substituted cycloalkyl, phenyl, benzyl and phenethyl radicals specified hereinabove being selected from the group consisting of bromine, chlorine, cyano, alkyl having 1 to 3 carbon atoms and alkoxy having 1 to 2 carbon atoms.

3,947,464
SALTS OF PHENYLPROPANOLAMINE WITH THIAZOLIDINE CARBOXYLIC ACIDS

Friedrich Asinger, Rott, and Heribert Offermanns, Grossauheim, both of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

Continuation-in-part of Ser. No. 276,236, July 28, 1972, abandoned. This application Nov. 27, 1973, Ser. No. 419,448
Claims priority, application Germany, Nov. 29, 1972, 2258410
Int. Cl.² C07D *277/04*
U.S. Cl. 260—306.7 C **7 Claims**

1. The salt of phenylpropanolamine with a thiazolidine-4-carboxylic acid of the formula



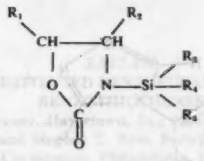
where R_1 and R_2 together are pentamethylene and Ac is benzoyl, tosyl, nitrophenyl sulfenyl, formyl or acetyl.

3,947,465
3-ALKYLSILYL-2-OXAZOLIDINONE COMPOUNDS AND SYNTHESIS THEREOF

Antonio Luis Palomo Coll, Maestro Perez Cabrero 7, Barcelona, Spain

Filed Feb. 19, 1974, Ser. No. 443,849
Claims priority, application Spain, Feb. 21, 1973, 411867
Int. Cl.² C07D *263/38*
U.S. Cl. 260—307 C **5 Claims**

1. A 3-alkylsilyl-2-oxazolidinone of the formula



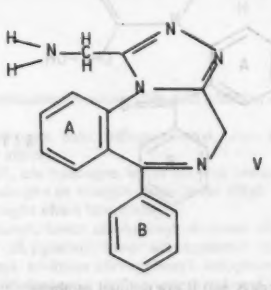
where R_1 and R_2 are each selected from the group consisting of hydrogen, phenyl, and alkyl having one to three carbon atoms, R_3 and R_4 are each alkyl having one to three carbon atoms and R_5 is an element selected from the group consisting of alkyl having one to three carbon atoms and chlorine.

3,947,466
INTERMEDIATES AND PROCESS FOR THE PRODUCTION OF CERTAIN TRIAZOLOBENZODIAZEPINES

Martin Gall, Kalamazoo, and Jackson B. Hester, Jr., Galesburg, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

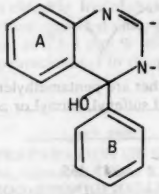
Continuation-in-part of Ser. No. 332,293, Feb. 14, 1973, Pat. No. 3,842,090. This application June 19, 1974, Ser. No. 480,980
Int. Cl.² C07D *249/08*
U.S. Cl. 260—308 R **17 Claims**

1. A process for the production of a compound of the formula V:

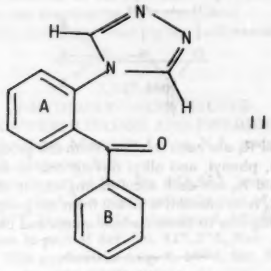


wherein the rings A and B are unsubstituted or substituted by chloro, fluoro, bromo, nitro or trifluoromethyl, which comprises:

1. reacting a compound of formula I



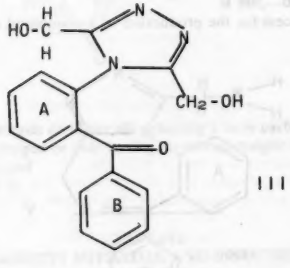
wherein a and B are defined as above, with an equimolar mixture of formic acid and acetic anhydride at 0° to 25°C and then warming the mixture at 90°–118° to obtain the corresponding compound of formula II:



II

wherein rings A and B are defined as above;

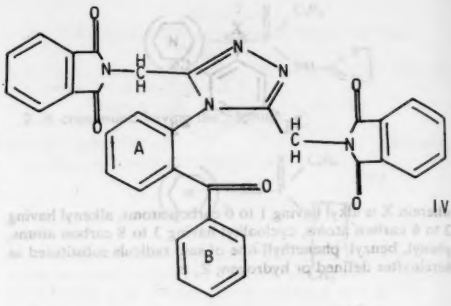
2. heating in an inert organic solvent a compound of formula II with paraformaldehyde to between 118° and 150°C., to obtain the corresponding compound III:



III

wherein rings A and B are defined as above;

3. treating compound III, dissolved in an inert organic solvent, with phthalimide, triphenylphosphine and diethyl azodicarboxylate at a temperature between 0° and 35°C., to obtain the corresponding compound IV:



IV

wherein rings A and B are defined as above;

4. treating the compound of formula IV with hydrazine hydrate at 60° to 100°C in an alkanol of 1 to 3 carbon atoms, inclusive, to obtain the compound of formula V as defined above.

3,947,467

3-(5-NITRO-2-IMIDAZOLYL) PYRAZOLES

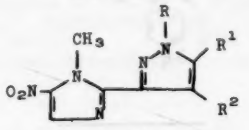
John Pomfret Verge, Henley-on-Thames; Martin Charles Neville, Feltham, both of England, and Henry Friedman, Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 385,136, Aug. 2, 1973, abandoned. This application May 13, 1974, Ser. No. 469,176

Int. Cl.² C07D *231/16*

U.S. Cl. 260—310 R **6 Claims**

1. A compound of the formula



wherein

R is C_1-C_3 alkyl, halo(C_1–C_3)alkyl, or hydroxy(C_1–C_3)alkyl;

R^1 is

R^2 is cyano; and

R^3 and R^4 are the same or different and are hydrogen or C_1-C_3 alkyl.

3,947,468

PRODUCTION OF DIBENZOPYRANS, THEIR ISOMERIC FLUORENOLS AND DIBENZOTHIOPYRANS

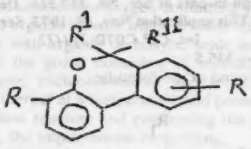
Walter L. Hall, Mount Vernon, Ind., and Jimmy L. Webb, Jonesville, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 147,163, May 26, 1971, abandoned. This application June 29, 1973, Ser. No. 374,906

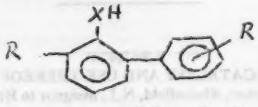
Int. Cl.[2] C07D *311/82*

U.S. Cl. 260—327 TH 18 Claims

1. A process of producing a dibenzo [b,d] pyran of the formula



where R is hydrogen, lower alkyl, C_{4-6}-cycloalkyl or phenyl, R^1 and R^{11}, taken together with the carbon atom to which both are attached, is cyclohexyl or lower alkyl substituted cyclohexyl, and, individually, R^1 is hydrogen, lower alkyl, C_{4-6}-cycloalkyl, lower haloalkyl or C_{4-6}-halocycloalkyl, wherein the α-carbon atom of said R and R^1 substituents, other than the hydrogen, has at least one hydrogen and no more than one halogen, and R^{11} is alkyl, cycloalkyl, haloalkyl or halocycloalkyl as defined for R^1 and, in addition, phenyl or substituted phenyl wherein the substituents are lower alkyl, C_{4-6}-cycloalkyl, halo or nitro, there being no more than one nitro group on any one phenyl ring comprising the reaction of (A) a benzenoid compound of the formula



where R is as previously defined, X is oxygen, and (B) a carbonyl compound having no more than 20 carbon atoms, the carbonyl group being ketonic or formyl, said compound having the formula

where R^1 and R^{11} are as defined above, subject to the proviso (C) that the benzenoid compound is reacted with the carbonyl compound in an acidic liquid phase (a) which is nonreactive with the (A) and (B) compounds (b) in which the (A) and (B) compounds are soluble, (c) which contains no more than 5% water by volume, and (d) whose acid strength, as measured on the Hammett H_0 scale is at least as strong as neat trifluoroacetic acid.

3,947,469

3-(1,3-DITHIAN-2-YL)-4-CYCLO-PENTENE-2-CARBOXYLIC ACIDS, ESTERS AND AMIDES

Leon Ghosez, Heverlee; Eric Cossement, Brussels, and Robert Biname, Kraainem, all of Belgium, assignors to Recherche et Industrie Therapeutiques (R.I.T.), Belgium

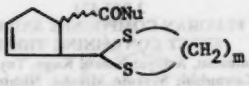
Filed Sept. 9, 1974, Ser. No. 504,394

Claims priority, application Luxemburg, Sept. 17, 1973, 68427

Int. Cl.[2] C07D *339/08*

U.S. Cl. 260—327 M 8 Claims

1. A compound of the formula



where Nu is hydroxy, lower alkoxy of 1 to 4 carbon atoms, amino, lower alkylamino of 1 to 4 carbon atoms, or dilower alkylamino, each alkyl having 1 to 4 carbon atoms;

m is 2 or 3; and

the wavy line indicates an α or β-configuration.

3,947,470

SUBSTITUTED BENZOFURANS AND BENZOTHIOPHENES

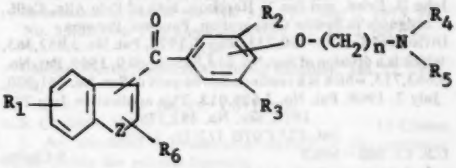
L. Martin Brenner, Havertown, Pa.; John M. Petta, Willingboro, N.J., and Stephen T. Ross, Berwyn, Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed June 20, 1974, Ser. No. 481,283

Int. Cl.[2] C07D *333/56*

U.S. Cl. 260—330.5 12 Claims

1. A compound of the formula:



or a pharmaceutically acceptable acid addition salt thereof, in which:

R_1 is hydrogen, halo, trifluoromethyl, nitro, lower alkyl or lower alkoxy;

R_2 and R_3 are hydrogen, lower alkyl or lower alkoxy;

R_4 is hydrogen or straight chain lower alkyl;

R_5 is straight chain lower alkyl;

R_6 is phenyl, lower alkylphenyl, di-lower alkylphenyl, tri-lower alkylphenyl, lower alkoxyphenyl, di-lower alkoxyphenyl, tri-lower alkoxyphenyl, halophenyl, dihalophenyl, trihalophenyl, trifluoromethylphenyl, benzyl, halobenzyl, lower alkylbenzyl, lower alkoxybenzyl or trifluoromethylbenzyl;

n is 2 to 4; and

Z is sulfur.

3,947,471

BENZ (c) FLUORAN COMPOUNDS AND RECORDING SHEET CONTAINING THEM

Takashi Akamatsu, Ashiya; Koichi Koga, Toyonaka; Mitsuru Kondo, Kawanishi; Makoto Miyake, Nishinomiya; Hiroshi Twasaki, Takatsuki; Masatoshi Matsuo, Ibaragi; Seiji Hotta, Hirakata; Isao Yuji, Takarazuka, and Yukiaki Ito, Minoo, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka and Kanzaki Paper Manufacturing Co., Ltd., Tokyo, both of, Japan

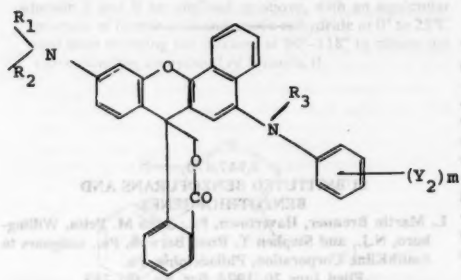
Continuation of Ser. No. 188,541, Oct. 12, 1971, abandoned. This application May 20, 1974, Ser. No. 471,698

Claims priority, application Japan, Dec. 26, 1970, 46-130387; Dec. 26, 1970, 46-130392

Int. Cl.[2] C07D *311/84*

U.S. Cl. 260—335 9 Claims

1. A compound represented by the formula:



wherein R_1 and R_2 each signify a lower alkyl group, R_3 signifies hydrogen, Y_2 signifies hydrogen, a lower alkyl or lower alkoxy group, and *m* is an integer of 1 to 3.

3,947,472

NAPHTHYL ACETALDEHYDE DERIVATIVES

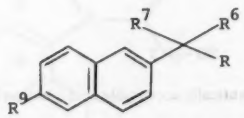
John H. Fried, and Ian T. Harrison, both of Palo Alto, Calif., assignors to Syntex Corporation, Panama, Panama

Division of Ser. No. 250,733, May 5, 1972, Pat. No. 3,852,363, which is a division of Ser. No. 814,855, April 9, 1969, Pat. No. 3,663,713, which is a continuation-in-part of Ser. No. 741,900, July 2, 1968, Pat. No. 3,626,012. This application July 29, 1974, Ser. No. 492,378

Int. Cl.[2] C07D *317/22*, *319/06*

U.S. Cl. 260—340.9 9 Claims

1. A compound selected from the group represented by the formula:



wherein R is $-CHR^1R^2$; R^1 and R^2 taken together are 3-hydroxypropylene-1,2-dioxy, $-OCHR^4-CHR^5O-$ or $-OCHR_6-CR^4R^5-CHR_6O-$, each of R^4 and R^5, independently of each other is hydrogen, alkyl having up to six carbon atoms, cycloalkyl having three to seven carbon atoms, cycloalkylmethyl having four to eight carbon atoms, 2-cycloalkylethyl having five to nine carbon atoms, benzyl or phenyl, said benzyl or phenyl being optionally substituted with one to two methyl, ethyl, isopropyl, methoxy, hydroxy, or chloro groups, or up to three fluoro groups; and R_6 is hydrogen, methyl, ethyl or propyl;

one of R^6 and R^7 is hydrogen, the other is hydrogen, methyl, ethyl, or difluoromethyl; or R^6 and R^7 taken together are methylene, halomethylene, or ethylene;

and R^9 is lower alkoxy.

3,947,473

ANTIOXIDANT CHROMAN COMPOUNDS

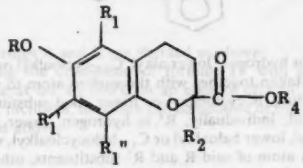
John William Scott, Upper Montclair; David Richard Parrish, Glen Ridge, and Gabriel Saucy, Essex Fells, all of N.J., assignors to Hoffman-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 317,566, Dec. 22, 1972, abandoned. This application Nov. 19, 1973, Ser. No. 417,465

Int. Cl.[2] C07D *311/72*

U.S. Cl. 260—345.5 5 Claims

1. A compound of the formula:



wherein R_1, R_1', R_1'' and R_2 are hydrogen or lower alkyl; R is hydrogen, lower alkonoyl benzyl, benzoyl; R_4 is hydrogen or lower alkyl.

3,947,474

CATALYST AND USE THEREOF

Robert S. Barker, Bloomfield, N.J., assignor to Halcon International, Inc., New York, N.Y.

Division of Ser. No. 300,026, Oct. 24, 1972, Pat. No. 3,838,067, which is a continuation-in-part of Ser. No. 76,249, Sept. 28, 1970, Pat. No. 3,759,840. This application Jan. 15, 1974, Ser. No. 433,602

Int. Cl.[2] C07D *307/60*

U.S. Cl. 260—346.8 A 3 Claims

1. A process for the preparation of maleic anhydride which comprises oxidizing benzene in the vapor-phase with molecular oxygen in the oxygen in the presence of a catalyst consisting essentially of oxides of molybdenum, vanadium, phosphorus, sodium and boron in combination with an oxide of at least one metal selected from the group consisting of manganese, tin, tungsten and bismuth, the relative amounts of said oxides expressed as Mo, V, P, Na, B, Mn, Sn, W and Bi, being per mol of V, 0.1 to 95 mol Mo, 0.01 to 0.5 mol P, 0.02 to 0.6 mol Na, 0.005 to 0.3 mol B, 0.005 to 0.1 mol Mn, 0.005 to 0.1 mol Sn, 0.005 to 0.1 mol W, and 0.005 to 0.1 mol Bi.

3,947,475

5-FUROYL-2,2,4-TRIMETHYL-1,4-DIHYDRO-1H-1,5-BENZODIAZEPINE AS AN ANTI-INFLAMMATORY AGENT

Jack R. DeBaun, Sunnyvale; Ferenc M. Pallos, Walnut Creek, and Don R. Baker, Orinda, all of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Apr. 28, 1975, Ser. No. 572,233

Int. Cl.[2] C07D *307/54*

U.S. Cl. 260—347.3 1 Claim

1. 5-furoyl-2,2,4-trimethyl-1,4-dihydro-1H-1,5-benzodiazepine.

3,947,476
PROCESS FOR THE CONTINUOUS PREPARATION OF PROPYLENE OXIDE

Georges Biola, Venissieux, and Gérard Schneider, Caluire, both of France, assignors to Rhone-Progil, Decines, France

Filed Jan. 25, 1974, Ser. No. 436,673
Claims priority, application France, Jan. 26, 1973, 73.02719
Int. Cl.² C07D 301/06
U.S. Cl. 260—348.5 V 8 Claims

1. In a liquid phase continuous process for producing propylene oxide comprising oxidizing propylene by contacting propylene with a molecular oxygen-containing gas in a solvent comprising an organic solvent which is water-insoluble and is as immiscible with organic carboxylic acids as possible and selected from the group consisting of monochlorobenzene, dichlorobenzene, trichlorobenzene and tetrachlorobenzene and mixtures thereof at a temperature and pressure necessary for the oxidation reaction and condensing the gaseous reaction products, the improvement comprising:

adding to the condensed gaseous reaction products an amount of water necessary to dissolve substantially any undissolved organic carboxylic acids present therein thereby producing a two-phase system comprising (1) an aqueous phase containing said acids and (2) an organic phase containing said solvent and unreacted propylene;

separating said aqueous phase from said two-phase system and recycling said organic phase to said reaction;

removing a liquid containing propylene oxide from the reaction system; and

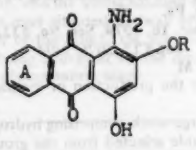
recovering said propylene oxide from said liquid.

3,947,477
PROCESS FOR THE PREPARATION OF AMINOHYDROXYANTHRAQUINONES

Horst Jager, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

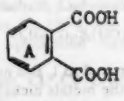
Filed June 21, 1974, Ser. No. 481,876
Claims priority, application Germany, June 22, 1973, 2331791
Int. Cl.² C07C 97/26, C09B 1/50
U.S. Cl. 260—380 2 Claims

1. Process for the preparation of a compound of the formula

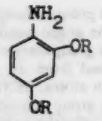


which comprises heating to a temperature of 100°–180°C in concentrated sulfuric acid in the presence of boric acid

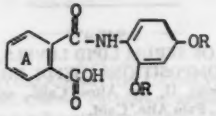
1. a mixture of an o-phthalic acid of the formula



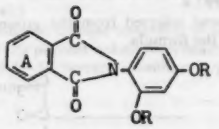
or its anhydride and an amine of the formula



or 2. an amide of the formula



or 3. an imide of the formula



wherein

R is hydrogen, C_1–C_4-alkyl, or cyclohexyl; and

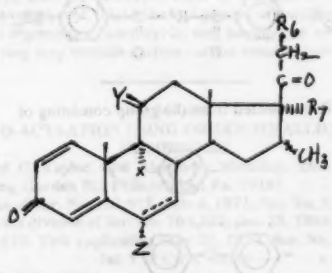
A is unsubstituted or substituted by fluoro, chloro, bromo, sulpho, carboxy, methoxy, ethoxy, methyl, ethyl, nitro, or C_1–C_4-alkylcarbonylamino.

3,947,478
ALKYLATED 3,20-DIKETO-Δ^4-STEROIDS OF THE PREGNANE SERIES

Gilbert Frederick Woods, Glasgow; James Cairns, Cumbernauld, and George McGarry, Airdrie, all of Scotland, assignors to Akzona Incorporated, Asheville, N.C.

Continuation-in-part of Ser. No. 320,777, Jan. 3, 1973, Pat. No. 3,862,194. This application Nov. 22, 1974, Ser. No. 526,204
Claims priority, application United Kingdom, Jan. 12, 1972, 1534/72
Int. Cl.² C07J 1/00
U.S. Cl. 260—397.3 11 Claims

1. An alkylated 3,20-diketo-Δ^4-steroid of the pregnane series having the general formula:



, wherein

X = a member of the group consisting of H, F and Cl;

Y = a member of the group consisting of H(OH), H(OAcyl), the acyl group being derived from a lower alkanoic acid, and O;

R_1 = a member of the group consisting of H, CH_3, F, and Cl;
R_2 = a member of the group consisting of CH_3 and C_2H_5;
R_3 = a member of the group consisting of H, OAcyl, the acyl group being derived from an organic carboxylic acid having 1-18 carbon atoms, OCH_3 and CH_3;
R_4 = a member of the group consisting of H and alkyl having 1–4 carbon atoms, with the proviso that R_4 is alkyl when R_3 is other than CH_3; and
C_1–C_2 and C_6–C_7 are selected from a saturated and an unsaturated bond.

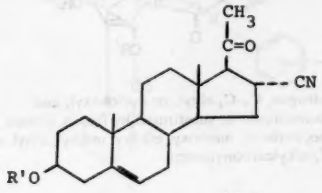
3,947,479

REDUCTION OF SERUM LIPID LEVELS, AND AGENTS AND COMPOSITIONS USEFUL THEREFOR

Wendell H. Rooks, II, Los Altos, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 315,997, Dec. 18, 1972, abandoned. This application Nov. 21, 1973, Ser. No. 417,972
Int. Cl.² C07J *3/00*
U.S. Cl. 260—397.4 **2 Claims**

1. A compound selected from the group of compounds represented by the formula:



(II)

where R′ is cycloalkyl having 3 to 6 carbon atoms.

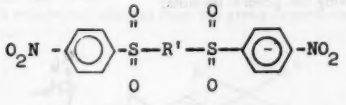
3,947,480

DINITRO- AND DIAMINO ARYLENE DISULFONES

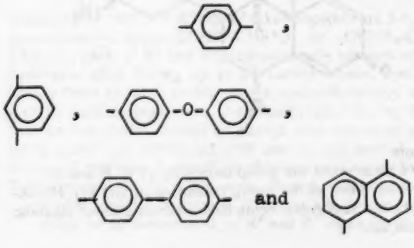
Iwhan Cho, Lincoln Park, N.J., assignor to Uniroyal, Inc., New York, N.Y.

Division of Ser. No. 248,367, April 28, 1972, Pat. No. 3,859,252. This application Nov. 6, 1974, Ser. No. 521,307
Int. Cl.² C07C *147/00*
U.S. Cl. 260—397.6 **4 Claims**

1. A bis (nitrophenylsulfonyl) arylene compound having the formula:



wherein R′ is selected from the group consisting of



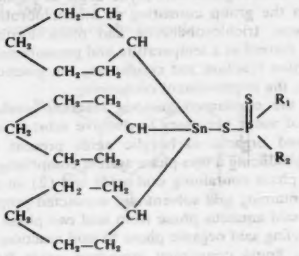
3,947,481

ORGANOTIN MITICIDAL AND INSECTICIDAL COMPOUNDS

Don R. Baker, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 293,974, Oct. 2, 1972, abandoned, and a continuation-in-part of Ser. No. 208,046, Dec. 10, 1971, abandoned. This application June 24, 1974, Ser. No. 482,035
Int. Cl.² C07F *7/22*
U.S. Cl. 260—429.7 **6 Claims**

1. A composition of matter consisting of the formula



wherein R_1 and R_2 are selected from radicals consisting of lower alkoxy having 1–6 carbon atoms and cyclohexoxy.

3,947,482

METHOD FOR PRODUCING OPEN FRAMEWORK ZEOLITES

Edwin W. Albers, Annapolis, and David E. W. Vaughan, Ellicott City, both of Md., assignors to W. R. Grace & Co., Columbia, Md.

Filed Mar. 20, 1974, Ser. No. 452,734
Int. Cl.² C01B *33/28*
U.S. Cl. 260—448 C **8 Claims**

5. A method as in claim 2 wherein said first aqueous mixture has a component ratio of:

1.6 Na_2O: 2.0 K_2O: Al_2O_3: 10.0 SiO_2: 160 H_2O

and wherein said open framework zeolite is offretite.

3,947,483

METAL CHRYSOTILE METHANE SYNTHESIS CATALYST

Thaddeus P. Kobylinski, and Harold E. Swift, both of Gibsonia, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 16, 1974, Ser. No. 532,848
Int. Cl.² C07C *1/04*
U.S. Cl. 260—449 M **9 Claims**

1. A process for the production of methane which comprises

contacting a charge stock comprising hydrogen and at least one carbon oxide selected from the group consisting of CO and CO_2 wherein the molar ratio of hydrogen to combined carbon oxides is at least 2:1 under methanation conditions with a catalyst comprising a metal silicate characterized as having repeating units having the structural formula:

$$[(1-x)Ni^a + xRu^b]_n\ (OH)_4Si_2O_5.wH_2O$$

where x is a number from 0 to 1, this number expressing the atomic fraction of the metals nickel and ruthenium, a is the valence of nickel, b is the valence of ruthenium, n is a number equal in value to that defined by the ratio

$6/[a(1-x)+bx]$
and w is a number ranging from 0 to 4.

3,947,484
CONTINUOUS PREPHOSGENATION PROCESS FOR THE PRODUCTION OF ORGANIC ISOCYANATES

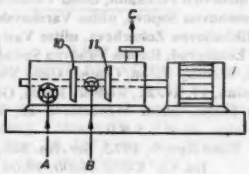
Alexander Mitrowsky, Dormagen-Hakenbroich; Helmut Klappert, Cologne, both of Germany; Karl-Friedrich Zenner, Antwerpn, Belgium, and Wilhelm Hagen, Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 299,977, Oct. 24, 1972, abandoned. This application May 31, 1974, Ser. No. 475,239

Claims priority, application Germany, Oct. 26, 1971, 2153268

Int. Cl.² C07C *118/02*

U.S. Cl. 260—453 PH **5 Claims**



1. A process for the continuous pre-phosgenation of organic primary amines which minimizes blockages due to deposition of solid material in the process apparatus comprising mixing, in the absence of external cooling, in the suction side of a multi-stage rotary pump of the non-self-induction type, a 20 to 65% by weight solution in an inert organic solvent of phosgene and a 5–40% by weight solution in an inert organic solvent of an organic primary amine, from about 1.5 to about 3 mols of phosgene being present per gram equivalent of said amine the phosgene solution being introduced via the suction inlet of the pump, and the amine solution being introduced via a lateral access inlet situated midway between the first and second impeller of the pump, the pre-phosgenation mixture thus obtained being conveyed via the discharge outlet of the pump to a hot-phosgenation stage.

3,947,485
CARBOTHIOLATES

Adolf Fischer, Mutterstadt; Karl-Heinz Koenig, Frankenthal, and Rudolf Kolbinger, Speyer, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

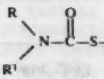
Filed May 31, 1974, Ser. No. 474,900

Claims priority, application Germany, June 7, 1973, 2329043

Int. Cl.² C07C *155/02*

U.S. Cl. 260—455 A **4 Claims**

1. A carbothiolate of the formula



where R denotes a monocycloaliphatic or bicycloaliphatic radical of 5 to 8 carbon atoms, R^1 denotes propenyl or butenyl, R^2 denotes lower alkyl of 2 to 4 carbon atoms or a benzyl radical which may be substituted in the p-position by halogen, and R^1 additionally denotes a propargyl or butyn-(2)-yl-(4) radical when R is norbornyl.

3,947,486
HYDROGENATION CATALYST

Alberto E. Veloso, Quezon, Philippines, assignor to Internationale Erfinder-und Patentanstalt, Vaduz, Liechtenstein

Division of Ser. No. 82,421, Oct. 20, 1970, Pat. No. 3,819,724. This application Apr. 12, 1974, Ser. No. 460,591

Int. Cl.² B01J *21/04, 23/64*

U.S. Cl. 252—465 **1 Claim**

1. A hydrogenation catalyst consisting of about 15–20 percent nickel, 15–20 percent cobalt molybdate, 15–20 percent ruthenium, and 45–55 percent aluminum deposited on a porous ceramic support.

3,947,487
MANUFACTURE OF ORGANIC NITRILES

Graham Robert Crooks, Billingham, England, assignor to Imperial Chemical Industries Ltd., London, England

Filed Oct. 11, 1974, Ser. No. 514,315

Claims priority, application United Kingdom, Jan. 17, 1974, 2194/74

Int. Cl.² C07C *120/02*

U.S. Cl. 260—465.3 **7 Claims**

1. A process for the conversion of butadiene or isoprene to 3-pentenenitrile or 4-methyl-3-pentenenitrile respectively which comprises reacting the butadiene or isoprene with hydrogen cyanide in the molar ratio of said butadiene or isoprene to hydrogen cyanide of 2:1 to 1:10 at −25° to 200°C and pressures up to 50 atmospheres in presence of from 0.0005 to 0.1 mole per mole of butadiene or isoprene of anhydrous cuprous chloride or anhydrous cuprous bromide and, for each part by weight of said cuprous chloride or cuprous bromide, of from 0.5 to 5 parts by weight of a thiol or sulphide of the formula

$$R_1SH \text{ or } R_1SR_2$$

in which R_1 and R_2 represent alkyl groups having from 1 to 6 carbon atoms, said alkyl being unsubstituted or substituted by hydroxyl, alkoxyl, carboxylic ester or halogen, or represent cyclohexyl, phenyl, tolyl or benzyl groups, or together with the S atom represent a heterocyclic ring having 5, 6 or 7 atoms, which ring may contain carbon-carbon unsaturation.

3,947,488
O-ACYLATION USING ORGANOTHALLIUM COMPOUNDS

Edward C. Taylor, and Alexander McKillop, both of 1500 Spring Garden St., Philadelphia, Pa. 19101

Division of Ser. No. 112,815, Feb. 4, 1971, Pat. No. 3,832,381, which is a division of Ser. No. 700,352, Jan. 25, 1968, Pat. No. 3,626,018. This application May 21, 1974, Ser. No. 471,925

Int. Cl.² C07C *69/66*

U.S. Cl. 260—473 A **7 Claims**

1. A process for O-acylating a β-dicarbonyl compound, said β-dicarbonyl compound having a methylene group between the carbonyl groups, comprising treating the thallous salt of such a β-dicarbonyl compound, prepared by reaction of the β-dicarbonyl compound with a thallous lower with a lower

alkanoyl halide of up to 10 carbon atoms at a temperature of about −78°.

3,947,489

COUPLING PROCESS

Maurice E. Brooks, Great Neck, N.Y.; Herbert Riegel, Palisades, N.J.; Harvey D. Schindler, New York, N.Y., and Morgan C. Sze, Upper Montclair, N.J., assignors to The Lummus Company, Bloomfield, N.J.

Filed Oct. 23, 1968, Ser. No. 769,791
Int. Cl.² C07C *67/00*
U.S. Cl. 260—488 H **24 Claims**

1. A process for coupling an alkane having no more than nine carbon atoms with an alkanoic acid having no more than five carbon atoms, comprising:

contacting the alkane and the alkanoic acid, both in the vapor phase, with a molten mixture comprising the higher and lower valent forms of a multivalent metal halide selected from the group consisting of the chlorides, iodides, and bromides of copper, manganese, iron, cobalt and chromium, said higher valent metal halide being present in an amount of at least 3 weight percent, said contacting being effected at a temperature from about 500°F. to about 1200°F. to produce a coupled compound which is the alkenyl ester of the alkanoic acid having a number of carbon atoms corresponding to the total number of carbon atoms in said alkane and said alkanoic acid.

3,947,490

PROCESS FOR PREPARING OMEGA-FORMYLOXY-ALKANALS

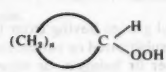
Jean Claude Brunie, Francheville-le-Haut; Michel Costantini; Noël Crenne, both of Lyon, and Michel Jouffret, Francheville-le-Bas, all of France, assignors to Rhone-Poulenc S.A., Paris, France

Filed May 31, 1974, Ser. No. 475,041
Claims priority, application France, June 4, 1973, 73.20228
Int. Cl.² C07C *67/00*
U.S. Cl. 260—488 F **9 Claims**

1. In a process for the preparation of an ω-formyloxy-alkanal of the general formula:

$$HC(O)O(CH_2)_nCHO$$

in which *n* represents an integer from 5 to 11, which comprises reacting formic acid with a cycloalkyl hydroperoxide of the formula:



in which *n* is as defined above, the improvement wherein the reaction is carried out in the presence of 0.005 to .5 hydrogen ion per liter of formic acid of a strong acid with a pK of less than 2.

3,947,491

STABILIZED CHOLINE SALICYLATE COMPOUNDS

William Kelly, deceased, late of Liverpool, England; by Monica Kelly, representative, Liverpool; by John Kelly, representative, Great Sankey, near Warrington, both of England, and Alfred Halpern, Village of Lake Success, N.Y., assignors to The Purdue Frederick Company, Norwalk, Conn.

Division of Ser. No. 237,927, March 24, 1972, Pat. No. 3,855,282. This application Sept. 3, 1974, Ser. No. 501,004
Int. Cl.² C07C *91/00*
U.S. Cl. 260—501.15 **6 Claims**

1. A choline salicylate salt-sulfite-complex compound selected from the group consisting of choline salicylate sodium sulfite, choline salicylate potassium sulfite and choline salicylate lithium sulfite.

5. The method for the preparation of a choline salicylate salt-sulfite-complex compound selected from the group consisting of choline salicylate sodium sulfite, choline salicylate potassium sulfite, and choline salicylate lithium sulfite comprising:

a. adding a sulfite-containing compound selected from the group consisting of sodium sulfite, potassium sulfite and lithium sulfite to an equimolecular quantity of choline salicylate,
b. mixing the same,
c. allowing to stand for at least one-half hour, and
d. recovering the formed choline salicylate salt-sulfite-complex compound therefrom.

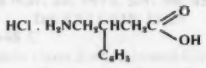
3,947,492

PROCESS FOR PRODUCING β-PHENYL-γ-AMINO BUTYRIC ACID HYDROCHLORIDE

Vsevolod Vasilievich Perekalin, ulitsa Voskova, 2, kv. 5; Alexandra Semenovna Sopova, ulitsa Varshavskaya, 73, kv. 64; Maiva Mikhailovna Zobacheva, ulitsa Vasi Alexeeva, 9, kv. 30, all of Leningrad; Rasma Yanovna Spunde, ulitsa Lenina, 2, kv. 51, Rizhsky Raion, Olaine; Uldis Yanovich Mikstais, ulitsa Lenina, 17, kv. 21, Rizhskv Raion, Olaine, and Maiya Petrovna Silaya, ulitsa Mendeleeva 20, kv. 48, Rizhskv Raion, Olaine, all of U.S.S.R.

Filed Apr. 9, 1973, Ser. No. 349,672
Int. Cl.² C07C *99/00*, *99/06*
U.S. Cl. 260—518 R **1 Claim**

1. A process for the production of the hydrochloride of β-phenyl-γ-amino-butyric acid of the formula:



which consists essentially of the steps of condensing malonic ester with β-nitrostyrene resulting in the separation of the methyl ester of α-carbomethoxy-β-phenyl-γ-nitrobutyric acid at a temperature ranging from 0° to 14°C; reducing the ester thus obtained by condensation with hydrogen in the presence of Raney nickel under a pressure of 6 to 30 atm; treating 3-carbomethoxy-4-phenyl-2-pyrrolidone, as formed by the reduction, with hydrochloric acid, and separating the hydrochloride of β-phenyl-γ-aminobutyric acid from the solution.

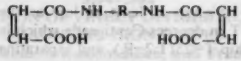
3,947,493

PROCESS FOR THE PRODUCTION OF MALEAMIC ACIDS

Maurice Balme, Sainte-Foy-les-Lyon, and Max Gruffaz, La Mulatiere, both of France, assignors to Rhone-Poulenc, S.A., Paris, France

Filed Oct. 5, 1973, Ser. No. 403,853
Int. Cl.² C07C *99/00*
U.S. Cl. 260—518 R **6 Claims**

1. In a process for the preparation, in suspension, of a maleamic acid of the general formula:



in which: R represents a linear or branched alkylene radical, an arylene radical, an aralkylene radical, an alkylarylene radical, a cyclo-alkylene radical or a divalent heterocyclic radical, the two free valencies of the heterocyclic radical being carried by carbon atoms, the total number of carbon atoms in the R radical being not more than 20, the minimum number of carbon atoms in the alkylene radical being 2, from a solution of primary diamine in a solvent and a solution of maleic anhydride in a solvent, the improvement wherein

the solution of the primary diamine is run into the solution of maleic anhydride in an amount such that there is an anhydride excess of 5 to 20 mol % relative to the theoretical amount necessary for the reaction with the amine,

the mixture is agitated,

and the reaction temperature is 40° to 130°C,

such that the time taken to run in the amine solution is at least 67 minutes,

and the amine solution is run in at a rate such that the slope of the curve representing the variation, as a function of time, in the rate of running in as % of the total amount of amine solution employed per minute has, at every point on this curve, a value not greater than **0.044.**

3,947,494

QUALITY OF PHTHALIC ACIDS IMPROVED BY HALOACETIC ACID

George E. Kuhlmann, Downers Grove, Ill., assignor to Standard Oil Company, Chicago, Ill.

Filed Dec. 20, 1972, Ser. No. 316,857
Int. Cl.[2] C07C *51/33*
U.S. Cl. 260—524 R **5 Claims**

1. A method for preparing a phthalic acid of improved quality by the oxidation of a xylene hydrocarbon with molecular oxygen in an oxidation zone containing a liquid phase of acetic acid solvent having dissolved therein one or more of cobalt, manganese or cerium and bromine as catalyst components at a temperature in the range of 50° to 275°C., which improvement consists essentially of also having in the acetic acid solution a catalytic amount of a mono-haloacetic acid having an aqueous dissociation constant K_4 greater than 1.0×10^{-3} wherein said catalytic amount is in the range of 0.1 to 12 weight percent of the xylene.

3,947,495

PROCESS FOR THE PREPARATION OF ACRYLIC AND METHACRYLIC ACIDS

Jawad H. Murib; Charles E. Frank, and Ben Seeskin, all of Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed July 1, 1974, Ser. No. 485,047
Int. Cl.[2] C07C *51/26*
U.S. Cl. 260—533 N **7 Claims**

1. In a process for the preparation of acrylic or methacrylic acid by oxidizing propylene or isobutylene in the vapor phase with molecular oxygen in the presence of a catalyst composition consisting of phosphoric acid and a catalytically effective amount of palladium metal the improvement which comprises conducting the process in the presence of a sulfur catalyst modifier selected from the group consisting of elemental sulfur, H_2S, SO_2, SO_3, H_2SO_3, H_2SO_4, thioether, triphenylsulfonium salt of the formula $(C_6H_5)_3SY$ where Y is Cl, ½ PO_4, NO_3, ½ SO_4 or ½ SO_3, diphenyl sulfoxide, dialkyl sulfoxide, metal sulfide, trialkyl thiophosphate of the formulae $(RS)_3P{=}O$ and $(RS)_3P{=}S$ wherein R is alkyl of 1–10 carbon atoms, and CS_2.

3,947,496

PROCESS FOR RECOVERING GLYCINE FROM SODIUM SULFATE SOLUTIONS

Jon Carl Thunberg, Amherst, N.H.; Robert Wright Bragdon, Marblehead, Mass., and William Philip Moore, Hudson, N.H., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 517,469, Oct. 24, 1974, which is a continuation-in-part of Ser. No. 442,543, Feb. 14, 1974, abandoned, which is a continuation-in-part of Ser. No. 319,539, Dec. 29, 1972, Pat. No. 3,808,269. This application Apr. 29, 1975, Ser. No. 572,841
Int. Cl.[2] C07C *99/12*
U.S. Cl. 260—534 R **6 Claims**

1. A process for recovering glycine from an aqueous starting solution consisting essentially of water, glycine, and sodium sulfate, the aqueous starting solution having a temperature above about 35°C, a pH of 4.5–8.5, a mole ratio of glycine to sodium sulfate of 1–5:1, the process comprising:

a. forming a first slurry consisting essentially of a first lot of precipitated solid glycine and a first mother liquor consisting essentially of water, dissolved glycine, and dissolved sodium sulfate by cooling the aqueous starting solution to a temperature above about 33°C effective for precipitating glycine;

b. separating the first mother liquor from the first lot of precipitated solid glycine while maintaining the first slurry at a temperature above about 33°C effective for separating the solid glycine, and recovering the separated solid glycine;

c. forming a second slurry consisting essentially of a first lot of precipitated solid sodium sulfate and a second mother liquor consisting essentially of water, dissolved glycine, and dissolved sodium sulfate by evaporating from the separated first mother liquor an amount of water effective for causing sodium sulfate to precipitate while maintaining the temperature of the resulting second slurry at a temperature effective for preventing the precipitation of solid glycine;

d. separating the second mother liquor from the first lot of precipitated solid sodium sulfate while maintaining the temperature of the second slurry at a temperature effective for preventing the precipitation of solid glycine;

e. forming a first solution consisting essentially of: (i) water; (ii) dissolved glycine; and (iii) dissolved sodium sulfate by admixing the separated second mother liquor with water and a second lot of aqueous starting solution, the water being provided in an amount effective for preventing the precipitation of sodium sulfate where the first solution is cooled in a later recited cooling step;

f. forming a third slurry consisting essentially of a second lot of precipitated solid glycine and a third mother liquor consisting essentially of water, dissolved glycine, and dissolved sodium sulfate by cooling the first solution to a temperature above about 33°C effective for causing the second lot of solid glycine to precipitate;

g. separating the third mother liquor from the second lot of precipitated solid glycine while maintaining the third slurry at a temperature above 33°C effective for separating the solid glycine, and recovering the separated solid glycine;

h. forming a fourth slurry consisting essentially of a second lot of precipitated solid sodium sulfate and a fourth mother liquor consisting essentially of water, dissolved glycine, and dissolved sodium sulfate by evaporating from the separated third mother liquor an amount of water effective for causing sodium sulfate to precipitate while maintaining the temperature of the resulting fourth slurry at a temperature effective for preventing the precipitation of solid glycine; and

i. separating the fourth mother liquor from the second lot of precipitated solid sodium sulfate while maintaining the temperature of the fourth slurry at a temperature effective for preventing the precipitation of solid glycine.

3,947,497

LIQUID PHASE OXIDATION OF METHYL ETHYL KETONE TO FORM ACETIC ACID THEREFROM

Charles C. Hobbs, Corpus Christi, Tex., and Hendrik A. van't Hof, Brielle, Netherlands, assignors to Celanese Corporation, New York, N.Y.

Filed Jan. 4, 1974, Ser. No. 431,005

Int. Cl.² C07C *51/28*

U.S. Cl. 260—541 **7 Claims**

1. A liquid phase oxidation process for the production of acetic acid from methyl ethyl ketone, which process is characterized by improved carbon efficiency and which comprises:

a. forming a liquid reaction mixture comprising methyl ethyl ketone, and at least one of the group consisting of formic acid and formic acid-producing compounds selected from the group consisting of lower alkanols, lower alkyl acetates, and lower alkyl formates, with methyl ethyl ketone being present in a predominant amount in the mixture on the acetic acid-free basis and with said formic acid or formic acid-producing compound constituting at least about 5 percent up to about 50 percent of the oxidizable components of said mixture;

b. oxidizing the liquid reaction mixture with cobalt acetate catalyst in acetic acid reaction solvent with a gas comprising molecular oxygen to form an oxygenated rection product mixture containing about 0.1 to 0.5 weight percent formic acid and,

c. recovering acetic acid reaction product from the reaction product mixture.

3,947,498

VITAMIN A INTERMEDIATES

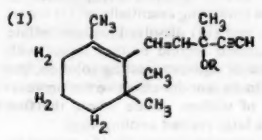
William Oroshnik, Plainfield, N.J., assignor to SCM Corporation, New York, N.Y.

Division of Ser. No. 353,215, April 23, 1973. This application Apr. 10, 1975, Ser. No. 566,972

Int. Cl.² C07C *43/18*

U.S. Cl. 260—611 V **2 Claims**

1. As a composition of matter, a class of compounds having the general formula:



in which R is lower alkyl; lower alkenyl, phenyl, or aralkyl of up to 10C atoms.

3,947,499

PHOSPHORIC ACID PURIFICATION

Robert Harry Edwards, Whitehaven; Thomas Alan Williams, Workington, and Kenneth Hall, St. Bees, all of England, assignors to Albright & Wilson Limited, Warley, England

Filed Jan. 30, 1974, Ser. No. 437,891

Claims priority, application United Kingdom, Feb. 7, 1973, 6056/73

Int. Cl.² C07C *43/00*; C01B *15/16, 25/26*

U.S. Cl. 260—614 R **25 Claims**

1. A process for preparing an anhydrous crystalline compound of phosphoric acid and diisopropyl ether having the formula $H_3PO_4[(CH_3)_2]_2O$, comprising mixing aqueous wet process phosphoric acid of 65–85 percent acidity with diisopropyl ether to produce an aqueous phase, and an organic phase which is a mixture of said ether and phosphoric acid in a molar proportion (R:1) of 0.6:1 to 1.4:1 and an amount of water of up to 1 mole water per mole of phosphoric acid, separating said aqueous phase from said organic phase, and forming crystals of said compound from said mixture at a temperature which is at least as low as the crystallization temperature T in degrees Centigrade which is determined by the relationship T=25(1.2−R), and separating said crystals.

3,947,500

PROCESS FOR TREATING REACTION MIXTURES BY CHEMICAL REDUCTION

John Kollar, Wallington, N.J., assignor to Halcon International, Inc., New York, N.Y.

Division of Ser. No. 871,522, Nov. 7, 1969, Pat. No. 3,860,622, which is a continuation of Ser. No. 684,563, Nov. 20, 1967, abandoned, which is a continuation of Ser. No. 409,941, Nov. 9, 1967, abandoned, which is a continuation-in-part of Ser. No. 375,313, June 15, 1964, abandoned. This application Apr. 5, 1974, Ser. No. 458,279

Int. Cl.² C07C *27/10, 29/00*

U.S. Cl. 260—618 H **4 Claims**

1. The process for treating the product mixture containing an alcohol from the epoxidation of an olefinic hydrocarbon having 2 to 30 carbon atoms with an organic hydroperoxide having the formula ROOH where R is an alkyl, cycloalkyl or carbocyclic aralkyl having 3 to 20 carbon atoms at a temperature of −20° to 200°C in the presence of a titanium, vanadium, chromium, selenium, zirconium, columbium, molybdenum, tellurium, tantalum, tungsten, rhenium, or uranium catalyst, in order to reduce the acidic catalyst characteristics of said product mixture at least to the extent that the rate of dehydration of alcohol contained therein is less than 50% per hour at 140°C which comprises the step of reacting said product mixture at a temperature of 0° to 150°C with a chemical reducing agent which is sodium bisulfite, a ferrous salt, ascorbic acid, hydroquinone or the iodide ion.

3,947,501

PROCESS FOR TREATMENT OF REACTION MIXTURES BY HYDROGENATION

John Kollar, Wallington, N.J., assignor to Halcon International, Inc., New York, N.Y.

Division of Ser. No. 871,522, Nov. 7, 1969, Pat. No. 3,860,662, which is a continuation of Ser. No. 684,563, Nov. 20, 1967, abandoned, which is a continuation of Ser. No. 409,941, Nov. 9, 1964, abandoned, which is a continuation-in-part of Ser. No. 375,313, June 15, 1964, abandoned. This application Apr. 5, 1974, Ser. No. 458,278

Int. Cl.² C07C *29/00, 27/10*

U.S. Cl. 260—618 H **5 Claims**

1. The process for treating the product mixture containing an alcohol from the epoxidation of an olefinic hydrocarbon having 2 to 30 carbon atoms with an organic hydroperoxide having the formula ROOH where R is an alkyl, cycloalkyl or carbocyclic aralkyl having 3 to 20 carbon atoms at a temperature of −20° to 200°C in the presence of a titanium, vanadium, chromium, selenium, zirconium, columbium, molybdenum, tellurium, tungsten, rhenium, or uranium catalyst, in order to reduce the acidic catalyst characteristics of said product mixture at least to the extent that the rate of dehydration of said alcohol contained therein is less than 50% per hour at 140°C which comprises the step of hydrogenating said product mixture in the presence of a hydrogenation catalyst at a temperature in the range of 0° to 150°C and at a pressure of 14.7 to 100 psia.

3,947,502

PRODUCTION OF FINELY DIVIDED ACICULAR MAGNETIC IRON OXIDES

Lutz Leitner, Rumeln-Kaldenhausen, and Franz Hund, Krefeld-Bochum, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 11, 1973, Ser. No. 322,819

Claims priority, application Germany, Jan. 21, 1972, 2202853

Int. Cl.² C01G 49/02

U.S. Cl. 423—632 6 Claims

1. In the production of acicular, ferromagnetic iron oxide of high coercive force by oxidizing an iron (II)-hydroxide suspension with an oxygen-containing gas to form acicular iron (III) oxide hydroxide and dehydrating the iron (III) oxide hydroxide, optionally tempering, reducing and re-oxidizing this into magnetic iron oxide, the improvement which comprises effecting the oxidation of the iron (II)-hydroxide suspension at a pH of at least 13, before the oxidation is more than 95% complete but after the oxidation is more than 50% complete SiO_2 being present in the suspension in the form of a sol or soluble salt, the resulting iron (III) oxide hydroxide having SiO_2 deposited thereon.

3,947,503

MANUFACTURE OF 1,6-HEXANEDIOL FROM BUTADIENE

Rudolf Kummer, Frankenthal, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Mar. 7, 1975, Ser. No. 556,470

Claims priority, application Germany, Mar. 25, 1974, 2414253

Int. Cl.² C07C 29/00

U.S. Cl. 260—635 E 3 Claims

1. A process for the manufacture of 1,6-hexanediol by hydroformylation of 1,3-butadiene, wherein, in a first hydroformylation stage, 1,3-butadiene is reacted with carbon monoxide and hydrogen at from 70° to 130°C and from 50 to 600 atmospheres in the presence of a rhodium complex which contains carbon monoxide and a tertiary organic phosphine or tertiary organic phosphite and a halogen atom as ligands, and with an alkanol or alkanediol of 1 to 4 carbon atoms, the rhodium compound is removed, the pent-3-en-1-al-acetal thus obtained is subjected to a second hydroformylation stage, either in the hydroformylation mixture from the first stage after the rhodium compound is removed or after isolation therefrom, with carbon monoxide and hydrogen at from 120° to 220°C and from 20 to 120 atmospheres in the presence of a cobalt carbonyl complex modified with a tertiary organic phosphine, the hydroformylation product thus obtained is hydrogenated by conventional methods in the presence of a hydrogenation catalyst at elevated temperature and superatmospheric pressure, and the 1,6-hexanediol produced is isolated, also by conventional methods.

3,947,504

SEPARATION AND RECOVERY OF 3-METHYL-3-BUTENE-1-OL

Sunao Kyo; Hideaki Oka; Katsuhiko Hayashi, and Hidetsugu Tanaka, all of Ibaragi, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Feb. 27, 1974, Ser. No. 446,421

Claims priority, application Japan, Mar. 8, 1973, 48-27791

Int. Cl.² C07C 29/24

U.S. Cl. 260—643 A 6 Claims

1. A process for the separation and the recovery of 3-methyl-3-butene-1-ol from an oily mixture containing the same and 4,4-dimethyl-1,3-dioxane, which mixture is obtained during the production of isoprene by the reaction of isobutene and formaldehyde through the intermediate 4,4-dimethyl-1,3-dioxane, said oily mixture having a boiling point not lower than 85°C at atmospheric pressure, which process comprises the steps of (1) heating at a temperature ranging between about 92° to 160°C said oily mixture in the presence of one-third to one-half mole of boric acid or boric acid anhydride per mole of 3-methyl-3-butene-1-ol contained in said oily mixture while eliminating the generated water azeotropically with 4,4-dimethyl-1,3-dioxane, (2) removing therefrom a first fraction by distillation which boils at a temperature not higher than 160°C at atmospheric pressure to separate the fraction containing 4,4-dimethyl-1,3-dioxane from a second fraction containing boric acid ester of 3-methyl-3-butene-1-ol, (3) recovering the second fraction remaining and (4) isolating 3-methyl-3-butene-1-ol therefrom.

3,947,505

1-HALO-DODECA-TRI(TETRA)-ENE

Daniel Helmlinger, Dubendorf, and Peter Naegeli, Wettingen, both of Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

Division of Ser. No. 337,341, March 2, 1973. This application Apr. 24, 1975, Ser. No. 571,186

Int. Cl.² C07C 21/02

U.S. Cl. 260—654 R 3 Claims

1. Halides of the general formula

$$Hal—CH_2—C(CH_3)=CH—CH_2—CH_2—C(CH_3)=CH—CH_2—A \quad (II)$$

wherein A represents a group of the formula

$$—CH_2—C(=CH_2)—CH=CH_2 \quad \text{or}$$

$$—CH=C(CH_3)—CH=CH_2 \quad \text{and}$$

Hal stands for a chlorine or bromine atom.

3,947,506

RECOVERY OF ISOPRENE

Hugh M. Lybarger, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 3, 1974, Ser. No. 457,329

Int. Cl.² C07C 7/06

U.S. Cl. 260—681.5 R 4 Claims

1. A method of recovery of isoprene from a hydrocarbon stream of predominately C-5 hydrocarbons and containing isoprene, n-pentane and other 5 carbon atom hydrocarbons which comprises subjecting said hydrocarbon stream to two successive high efficiency distillations, the first distillation being conducted in a manner as to remove as an overhead fraction, hydrocarbon components of said stream which are more volatile than the azeotrope of isoprene/n-pentane and as a bottom fraction the other hydrocarbons in said stream, subjecting the bottom fraction from the first distillation to the second distillation, the second distillation being conducted in a manner as to remove a composition containing about 73.4 weight percent isoprene and about 26.6 weight percent n-pentane, the azeotrope of isoprene/n-pentane as an overhead fraction and as a bottom fraction the other hydrocarbons which are less volatile than the azeotrope of isoprene/n-pentane, and recovering the isoprene/n-pentane azeotrope.

3,947,507

METHOD OF PRODUCING LIQUID OLEFIN POLYMER

Hiroshi Isa, Funabashi; Hiroshi Mandai, Chiba; Toshiyuki Ukigai, Yachiyo; Anri Tominaga, Tokyo; Ryozo Taniyasu, Narashino, and Masuzo Nagayama, Tokyo, all of Japan, assignors to Lion Fat & Oil Co., Ltd., Tokyo, Japan

Filed Feb. 26, 1974, Ser. No. 446,017

Claims priority, application Japan, Mar. 5, 1973, 48-26352; Mar. 5, 1973, 48-26353

Int. Cl.² C07C 3/18, 3/21

U.S. Cl. 260—683.15 B 20 Claims

1. The process of preparing a synthetic lubricating oil, which comprises: dissolving in an inert organic solvent or dispersing in a liquid hydrocarbon a halide substance selected

from the group consisting of BCl_3, $AlCl_3$, $AlBr_3$, $Al(C_2H_5)Cl_2$ and mixtures thereof, adding an alkali metal hydride to the thus-formed solution or dispersion, distilling off solvent from the solution to concentrate said solution, adding to said concentrated solution or to said dispersion $TiCl_4$ and a liquid monomer selected from the group consisting of α-olefins having from 6 to 14 carbon atoms and mixtures thereof, and polymerizing said monomer at a temperature of above 70°C and below 200°C, the polymerization reaction mixture containing from 0.2 to 5.0 mol percent of $TiCl_4$ based on the monomer, from 0.5 to 2.0 mols of said halide substance per mol of $TiCl_4$ and from 0.5 to 6.0 mol of alkali metal hydride per mol of said halide substance;

and recovering from the polymerization reaction mixture a liquid synthetic lubricating oil consisting essentially of oligomers of said monomer.

3,947,508
REMOVAL OF HCl BY DISTILLING A VINYL CHLORIDE FEED IN SOLUTION WITH AN ALCOHOL

Yves Correia, and Jean-Claude Lanet, both of Saint-Auban, France, assignors to Rhone-Progil, Courbevoie, France

Filed June 3, 1974, Ser. No. 476,051

Claims priority, application France, June 20, 1973, 73.22444

Int. Cl.² C07C *19/00, 21/00*

U.S. Cl. 260—652 P **9 Claims**

1. In a process for removing hydrochloric acid and other impurities which are contained in crude vinyl chloride monomer, by treatment in a distillation zone, the improvement comprising, adding to the crude vinyl chloride at least one alcohol selected from the group consisting of C_4 to C_{10} tertiary aliphatic alcohols and C_3 to C_{10} primary and secondary alcohols with unsaturation in the alpha position, in a molar ratio equal to at least one mole of alcohol to one mole of hydrochloric acid, said alcohol reacting chemically with hydrochloric acid within said zone.

3,947,509
METHOD FOR PREPARATION OF HYDROCARBON LIQUID POLYMERS

Hiroshi Isa; Toshiyuki Ukigai, both of Yachiyo; Anri Tominaga, Tokyo; Ryozo Taniyasu, Narashino, and Masuzo Nagayama, Tokyo, all of Japan, assignors to Lion Fat & Oil Co., Ltd., Tokyo, Japan

Filed Feb. 14, 1975, Ser. No. 549,864

Claims priority, application Japan, Feb. 22, 1974, 49-20476

Int. Cl.² C07C *9/00*; C10M *1/16*

U.S. Cl. 260—676 R **14 Claims**

1. A method of polymerizing feed olefins having at least 6 carbon atoms or mixtures of such feed olefins, to produce a hydrocarbon liquid polymer, which comprises: polymerizing said feed olefin at a temperature of more than 60°C, in contact with a catalyst prepared by reacting at a temperature of more than 60°C, catalyst constituents consisting essentially of (a) aluminum chloride, (b) ketone having at least 4 carbon atoms, (c) olefin catalyst constituent selected from the group consisting of said feed olefin and olefins of lower carbon atom number, and (d) ester, ether or alcohol, the amount of (a) being from 0.1 to 5 mole percent based on the feed olefin, the molar ratio of (a)/(b) being from 1/1 to 1/1.2, the amount of (c) being more than 1 mole percent based on (a) and the amount of (d) being from 0.01 to 0.3 mole per mole of (a).

3,947,510
HYDROGENATION OF LINEAR HYDROCARBON DIOLEFINS TO LINEAR HYDROCARBON OLEFINS

Morello Morelli, San Donato Milanese, and Fortunato De Marco, Milan, both of Italy, assignors to Snamprogetti S.p.A., San Donato Milanese, Italy

Division of Ser. No. 382,055, July 24, 1973, Pat. No. 3,857,894. This application Dec. 30, 1974, Ser. No. 537,378

Int. Cl.² C07C *11/00*; C10G *17/00*

U.S. Cl. 260—677 H **6 Claims**

1. A process of hydrogenating a linear hydrocarbon diolefin by contacting said linear hydrocarbon diolefin with hydrogen in the presence of a palladium base catalyst, wherein the improvement comprises increasing the selectivity of the hydrogenation of said linear hydrocarbon diolefin to linear hydrocarbon olefin by adding to the hydrogenation mixture an aqueous solution of a zinc salt having a ratio of water/zinc of at least 1/1 by weight.

3,947,511
1-HYDROCARBYL-3-MONO- AND -DITHIOCARBAMOYLUREAS

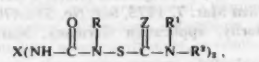
Maynard S. Raasch, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 25, 1970, Ser. No. 92,951

Int. Cl.² C07C *155/04, 155/09*

U.S. Cl. 260—545 R **4 Claims**

1. A compound of the formula



wherein:

Z is S or O;

R and R^1, alike or different, are hydrogen, or a hydrocarbon radical of up to 8 carbon atoms selected from the group consisting of alkyl, cycloalkyl, alkenyl, aryl, alkaryl, and aralkyl; and R^2 is a hydrocarbon radical of up to 8 carbon atoms selected from the group consisting of alkyl, cycloalkyl, alkenyl, aryl, alkaryl and aralkyl; or R^1 and R^2, taken together ($R^1 + R^2$), are (1) a chain of 4, 5 or 6 methylene groups which chain may be substituted with an alkyl group of 1 to 4 carbon atoms, or (2) $—CH_2CH_2—O—CH_2CH_2—$; and

X is a radical of up to 13 carbon atoms selected from the group consisting of alkylene, O- or S-interrupted alkylene, alkenylene, alkylenebis(arylene), arylenebis(alkylene), and arylene.

3,947,512
PROCESS FOR THE MANUFACTURE OF AROMATIC SULFONIC ACID HALIDES

Kurt Gengnagel, Offenbach, Main; Theodor Papenfuhs, Frankfurt am Main, and Manfred Zimmermann, Offenbach, Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Feb. 20, 1974, Ser. No. 444,260

Claims priority, application Germany, Feb. 20, 1973, 2308262

Int. Cl.² C07C *143/70*

U.S. Cl. 260—543 R **2 Claims**

1. A process for the manufacture of aromatic sulfonic acid chlorides of the formula

$$A — SO_2Cl$$

in which A is phenyl or phenyl substituted by a group or groups selected from alkyl of 1 to 4 carbon atoms, nitro, trifluoromethyl, carboxy, hydroxy, alkylsulfonyl of 1 to 4 carbon atoms, alkenylsulfonyl of 1 to 4 carbon atoms or halogen, or is naphthyl, which comprises reacting in an aqueous strongly hydrochloride solution in the absence of an organic

solvent and in the presence of copper or copper compounds a diazonium compound of an aromatic amine of the formula

$$A - NH_2$$

wherein A is defined as above, with an alkali metal hydrogen sulfite.

3,947,513

N-SULFINYL-N'-ARYL-HYDRAZINES

Engelbert Kühle, Berg. Gladbach; Erich Klauke, Odenthal-Hahnenberg, and Paul-Ernst Frohberger, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

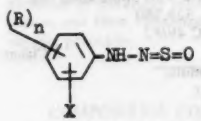
Filed Sept. 4, 1973, Ser. No. 394,365

Claims priority, application Germany, Sept. 12, 1972, 2244616

Int. Cl.² C07C *145/02*

U.S. Cl. 260—551 S **8 Claims**

1. An N-sulfinyl-N'-aryl-hydrazine of the formula



(I)

in which

X is trifluoromethyl or trifluoromethoxy,

n is 0, 1 or 2, and

R is methyl, trifluoromethyl, methoxy or halogen.

3,947,514

PROCESS FOR PREPARATION OF N,N-DIALKYL TOLUAMIDE

Masatomo Ito, and Taketosi Naito, both of Yokohama, Japan, assignors to Showa Denko K.K., Tokyo, Japan

Filed Apr. 9, 1975, Ser. No. 566,312

Int. Cl.² C07C *103/22*

U.S. Cl. 260—558 R **4 Claims**

1. A process for the preparation of a N,N-dialkyl-meta (or para)-toluamide, which comprises reacting meta(or para)-tolunitrile with a dialkylamine, with the alkyl group containing 1 to 4 carbon atoms, and water in the liquid phase in the presence of adipic acid as a catalyst at a temperature of 100°-400°C., the amounts of the dialkylamine and water being 0.8–3.0 mols and 0.8–5.0 mols respectively per mol of the tolunitrile and the amount of adipic acid being 0.001–15 mol percent based on the tolunitrile.

3,947,515

PROCESS FOR THE PREPARATION OF PURE, AROMATIC-o-HYDROXY-CARBOXYLIC ACID ARYL AMIDES

Sighart Miedtank, Dreieichenhain; Adam Rüffer, Hofheim, Taunus, and Hans Galster, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Feb. 4, 1975, Ser. No. 546,932

Claims priority, application Germany, Feb. 8, 1974, 2405986

Int. Cl.² C07C *102/04*

U.S. Cl. 260—559 S **10 Claims**

1. In a process for the preparation of an aromatic o-hydroxy-carboxylic acid aryl amide by condensing an aromatic o-hydroxy-carboxylic acid with an aryl amine in the presence of phosphorus chlorides in an organic solvent or diluent, the improvement comprising adding to the reaction mixture or the reaction product 1 to 25 %, calculated on the weight of the reaction product, of an aliphatic aminopolycarboxylic acid or an alkali metal or alkaline earth metal salt thereof as chelate forming agent.

3,947,516

NOVEL AROMATIC ALDEHYDES AND PROCESS FOR PREPARING THEM

Klaus Hunger, Kelkheim, Taunus, and Theodor Papenfuhs, Frankfurt am Main, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

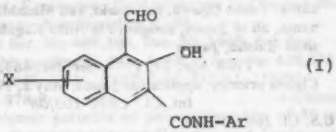
Filed July 18, 1974, Ser. No. 489,538

Claims priority, application Germany, July 20, 1973, 2337023

Int. Cl.² C07C *103/26*

U.S. Cl. 260—559 S **14 Claims**

1. A compound of the formula



(I)

wherein X is hydrogen, chlorine or bromine and Ar is naphthyl or phenyl which may be substituted by 1 to 3 substituents of the group of alkyl with 1–4 C-atoms, alkoxy with 1–4 C-atoms, alkylsulfonyl with 1–4 C-atoms, carbalkoxy with 1–4 C-atoms, chlorine, bromine, trifluoromethyl, nitro, cyano, benzoylamino, alkanoylamino with 1–4 C-atoms, carbonamido or sulfonamido.

3,947,517

STEREOSELECTIVE INTRODUCTION OF TETRACYCLINES HYDROXYL GROUP AT 12(a) POSITION IN SYNTHESIS OF TETRACYCLINES

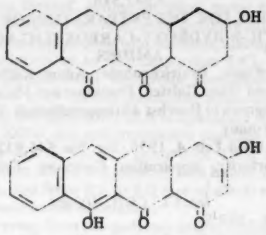
Hans H. Muxfeldt, Ithaca, N.Y., and Jeffrey Michael, Braunschweig, Germany, assignors to Research Corporation, New York, N.Y.

Continuation of Ser. No. 832,680, June 17, 1969, abandoned. This application Dec. 29, 1972, Ser. No. 319,486

Int. Cl.² C07C *103/19*

U.S. Cl. 260—559 AT **9 Claims**

1. In the process for the stereospecific 12*a* hydroxylation of a 12*a* deoxytetracycline precursor wherein said precursor is contacted with molecular oxygen, said precursor being selected from the group consisting of



tautomeric forms thereof, and mono- or polysubstituted derivatives thereof having substituents selected from the group consisting of bromo, iodo, chloro, fluoro, trifluoromethyl, nitro, cyano, amino, cyanoto, thiocyanato, azido, lower alkyl amino, hydroxy, alkanoyl amino, lower alkyl, and lower mono-substituted alkyl having fluoro, lower alkyl mercapto, lower alkoxy, lower alkyl amino, alkanoyl oxy, and alkanoyl amino groups;

the improvement comprising carrying out said 12(a) hydroxylation in the presence of a strong base selected from the group consisting of alkali metal amides, alkali metal butoxides, alkali metal alkyls of 1 to 6 carbon atoms, alkali metal hydrides and magnesium alkoxides;

said reaction being carried out in the presence of a non-protic solvent which is inert with respect to the tetracycline structure in the presence of said strong base, and which does not release protons in the presence of said strong base.

3,947,518

PROCESS FOR PURIFYING ACRYLAMIDES

Iwao Ohshima; Seiichi Chiba; Kenzo Ariyama, all of Yokohama; Yasuo Ogawa, Kawasaki, and Masahide Ozaki, Yokohama, all of Japan, assignors to Nitto Kagaku Kogyo Kabushiki Kaisha, Japan

Filed Apr. 29, 1974, Ser. No. 465,303

Claims priority, application Japan, May 2, 1973, 48-49506

Int. Cl.² C07C *103/08*

U.S. Cl. 260—561 N **15 Claims**

1. A process for purifying an acrylamide containing cross-linking impurities which comprises adding an inorganic base (excluding ammonia) to an aqueous solution containing 15 to 60% by weight of the acrylamide at a temperature of up to 60°C, in a quantity of 0.1 to 1.5% based on the acrylamide; and blowing a gas inert to the acrylamide into the resulting mixture at a hydrogen ion concentration of pH of 12 to 13.7 thereby carrying off, by the gas, ammonia which is a hydrolysis product of said cross-linking impurities from the aqueous solution in which the acrylamide remains substantially intact.

3,947,519

PREPARATION OF OPTICALLY ACTIVE ALLETHRORONE VIA ALLETHRONYL ACID PHTHALATE

Masanao Matsui, Tokyo; Fukashi Horiuchi, Kawanishi; Hajime Hirai, and Nobushige Itaya, both of Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

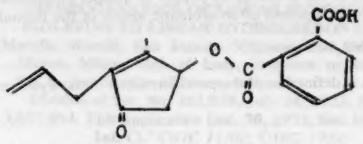
Filed Mar. 28, 1974, Ser. No. 455,725

Claims priority, application Japan, Mar. 29, 1973, 48-36473

Int. Cl.² C07C *45/00*

U.S. Cl. 260—586 R **9 Claims**

1. A method for preparing allethrolone, which comprises hydrolyzing 2-allyl-4-hydroxy-3-methyl-2-cyclopentenone acid phthalate represented by the formula



(I)

in water or an aqueous solvent consisting of water and a solvent selected from the group consisting of methanol, ethanol, glycerine, ethyleneglycol, diethyleneglycol, triethyleneglycol, acetate, tetrahydrofuran, dioxane, dimethylsulfoxide and dimethylformamide with or without a base of less than a small excess of the equivalent, said base being selected from the group consisting of alkali metal and alkali earth metal hydroxides, carbonates, bicarbonates, phosphates, cyanides, sulfides, borates, formates, acetates, propionates and benzoates, and amines and mixtures thereof.

3,947,520

COMPOUNDS AND PROCESS FOR PREPARING THE SAME

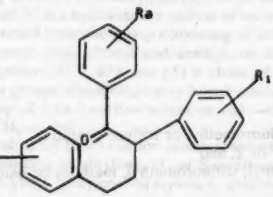
Daniel Lednicer, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 89,063, Nov. 12, 1970, Pat. No. 3,875,242, which is a continuation-in-part of Ser. No. 694,859, Jan. 2, 1968, abandoned, which is a continuation-in-part of Ser. No. 364,288, May 1, 1964, abandoned. This application Dec. 5, 1974, Ser. No. 529,750

Int. Cl.² C07C *49/82*

U.S. Cl. 260—590 D **3 Claims**

1. A compound having the formula:



wherein R represents alkoxy or cycloalkoxy; R_1 is selected from the group consisting of hydrogen, lower alkyl and halogen; and Ra is selected from the class consisting of hydrogen, halogen, alkyl, hydroxy and alkoxy, wherein the alkyl and alkoxy radicals each contain from 1 to 4 carbon atoms, inclusive, and the cycloalkoxy radical contains from 3 to 6 carbon atoms, inclusive.

3,947,521

OXIDATION OF ALLYLACETONE TO 2,5-HEXANEDIONE

Ralph H. Lasco, Painesville, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Apr. 8, 1974, Ser. No. 458,475

Int. Cl.² C07C *45/00*

U.S. Cl. 260—593 R **6 Claims**

1. In a process wherein allylacetone is oxidized to 2,5-hexanedione in a mixed solvent system containing per part of water, by volume, from one to two parts benzene by contacting said allylacetone with palladium chloride catalyst in the presence of copper chloride and oxygen, the improvement which comprises conducting the reaction without adding hydrochloric acid and employing from 25 to 55 moles of

copper chloride per mole of palladium chloride, the amount of copper chloride being sufficient to provide a molar ratio of said copper chloride to allylacetone of 1.3 – 2.4, whereby greater than 80% allylacetone conversion is effected with at least 70% selectivity to 2,5-hexanedione and with minimal losses of the palladium catalyst.

3,947,522
EPOXY RESIN COMPOSITIONS

Ralph R. Shelley, Jr., and James A. Clarke, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 340,392, March 12, 1973, abandoned. This application Feb. 12, 1975, Ser. No. 549,398

Int. Cl.² C08L *63/10*

U.S. Cl. 260—837 R **25 Claims**

1. A curable epoxy resin modified with a sulfur or organic peroxide vulcanized polymer of butadiene and acrylonitrile, methacrylonitrile or mixtures of acrylonitrile and methacrylonitrile comprising

A. an epoxy resin having an average of more than one vicinal epoxy group and

B. from about 0.03 to about 0.2 parts by weight per part by weight of Component (A) of unvulcanized polymer of butadiene and acrylonitrile, methacrylonitrile or mixtures of acrylonitrile and methacrylonitrile having an average molecular weight of from about 2000 to about 20,000 and containing from about 1.2 to about 5 groups per molecule of a reactive group selected from -COOH, -OH or -SH;

wherein said unvulcanized polymer has been reacted into the molecule of the epoxy resin through the -COOH, -OH, or -SH groups and then vulcanizing said polymer with sulfur or an organic peroxide.

3,947,523
COMPOSITION COMPRISING EPOXY RESIN, COPOLYMER OF BUTADIENE AND ACRYLIC ACID, CURING AGENT AND INORGANIC METAL SALT

Otto G. Schaffling, Cheshire, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Oct. 2, 1961, Ser. No. 143,274

Int. Cl.² C08L *63/10*

U.S. Cl. 260—837 R **2 Claims**

1. A composition of matter comprised of an epoxy resin, a copolymer of butadiene and acrylic acid, a curing agent, and between about 2.5 and about 30 percent by weight of an inorganic metal salt selected from the group consisting of metal chromates, metal bichromates, metal phosphates, and mixtures thereof.

3,947,524
RESIN COMPOSITION HAVING HIGH IMPACT RESISTANCE

Yukio Hozumi; Akira Ohi; Yuzo Toga, all of Sakai; Hiroyuki Yoshizaki, Toyonaka; Hiromitsu Takanohashi, Takarazuka, and Yoshitaka Masuda, Toyonaka, all of Japan, assignors to Daicel Ltd., Osaka and Mitsubishi Gas Chemical Company Inc., Tokyo, both of, Japan

Filed Oct. 23, 1974, Ser. No. 517,197

Claims priority, application Japan, Oct. 25, 1973, 48-120161

Int. Cl.² C08L *67/06*

U.S. Cl. 260—873 **3 Claims**

1. A flame-retardant impact-resistant resin composition, in which the resin components consist essentially of a blend of

A. 20 to 85 weight percent of a high molecular weight aromatic polycarbonate copolymer prepared from a mixture of bisphenols consisting essentially of 2 to 30 molar percent of a bisphenol the nucleus of which is substituted with a halogen and the balance is a halogen-free bisphenol and

B. the balance is an ABS resin comprising a mixture of (1) a graft copolymer of a butadiene-based rubbery polymer to which is grafted a vinyl aromatic hydrocarbon and acrylonitrile; and (2) a copolymer of a vinyl aromatic hydrocarbon and acrylonitrile, the amount of said rubbery polymer being 5 to 40 weight percent of B.

3,947,525
MELT-PROCESSABLE, RADIATION CROSS-LINKABLE E-CTFE COPOLYMER COMPOSITIONS

Arthur B. Robertson, Succasunna, and Robert J. Schaffhauser, Brookside, both of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Jan. 30, 1973, Ser. No. 327,907

Int. Cl.² C08L *23/00;* **C08F** *214/24, 259/08*

U.S. Cl. 204—159.17 **15 Claims**

1. A copolymer composition which comprises an admixture of an ethylene/chlorotrifluoroethylene copolymer and by weight of the copolymer, (a) about 0.1 to 5 % of a radiation cross-linking promoter selected from the group consisting of triallylisocyanurate, triallylcyanurate, triallylphosphite, diallylfumarate, diallylisophthalate and diallylterephthalate, (b) about 0.01 tp 5 % of an anti-oxidant selected from the group consisting of (1) mixtures of a phosphite or an organic polyhydric phenol and a salt of a carboxylic acid and a metal of Group II of the Periodic Table, (2) alkylated phenols and bisphenols having 1 to 18 carbon atoms in the alkyl chain, (3) alkylidene bis, tris and polyphenols having 1 to 8 carbon atoms in the alkylidene chain, and (4) mixtures of (1), (2) or (3) with an ester or alkali metal salt of thiodipropionic acid and (c) about 0.1 to 30 percent of an acid scavenger comprising an oxide of a metal of Group II of the Periodic Table.

3,947,526
POLYMERIZATION OF VINYLPYRIDINE

Robert Bacskai, Kensington, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 889,304, Dec. 30, 1969, Pat. No. 3,828,016. This application Feb. 1, 1974, Ser. No. 438,834

Int. Cl.² C08L *23/26;* **C08F** *2/18, 255/02, 255/08*

U.S. Cl. 260—878 R **4 Claims**

1. Small polymer particles of polyvinylpyridine of 50 to 2,000 microns diameter having small particles of Ziegler-catalyzed polymer embedded therein, said polymer particles of polyvinylpyridine being produced by the process which comprises polymerizing vinylpyridine in aqueous suspension in the presence of solid particles having diameters in the range 50–600 microns of Ziegler-catalyzed polystyrene or polyolefin of low molecular weight olefins, said polyolefin being derived from 1-olefins having up to about 6 carbon atoms each, wherein the weight ratio of polystyrene or polyolefin particle:-vinylpyridine is in the range of about 1.5:1 to about 100:1, the suspension polymerization being carried out in the presence of a water-soluble free radical initiating catalyst.

3,947,527
POLYMERIZATES OF OLEFINIC NITRILES AND DIENE RUBBERS

George S. Li, Aurora, and Gerald P. Coffey, Cleveland Heights, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Feb. 21, 1975, Ser. No. 551,773

Int. Cl.² C08L *9/02*

U.S. Cl. 260—879 **10 Claims**

1. The polymeric composition resulting from the copolymerization of 100 parts by weight of

A. about 50 to 90% by weight of at least one nitrile having the structure

wherein R is hydrogen, a lower alkyl group having from 1 to 4 carbon atoms or a halogen, and

B. from 10 to 50% by weight of at least one member selected from the group consisting of indene and coumarone in the presence of from 1 to 40 parts by weight of

C. a rubbery polymer of at least 50% by weight of a conjugated diene monomer selected from the group consisting of butadiene and isoprene and up to 50% by weight of at least one member selected from the group consisting of styrene, acrylonitrile, and ethyl acrylate.

3,947,528

ADDITIVES FOR POWDER RESINS

Frank Wingler, Leverkusen; Richard Müller, Bergisch Neukirchen, and Dieter Pollheide, Leichlingen, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Division of Ser. No. 315,621, Dec. 15, 1972, Pat. No. 3,865,904. This application May 16, 1974, Ser. No. 470,621 Claims priority, application Germany, Dec. 22, 1971, 2163675

Int. Cl.² C08L *33/04*

U.S. Cl. 260—901 **1 Claim**

1. A powdered solvent-free composition comprising from 0.1 to 5% by weight of a solvent-free copolymer having an average molecular weight of from 1,000 to 10,000 and a viscosity of from 1 to 1,000 poises at 100°C., said copolymer comprising copolymerized units of:

I. from 1 to 20 parts by weight of an α,β-monoolefinically unsaturated carboxylic acid having from 3 to 5 carbon atoms;

II. from 0 to 50 parts by weight of an ester of acrylic acid or methacrylic acid having from 1 to 4 carbon atoms in the alcohol radical and

III. from 30 to 99 parts by weight of an ester of acrylic or methacrylic acid having from 5 to 20 carbon atoms in the ester alcohol,

and from 95 to 99.9% by weight of a solvent-free copolymer, said copolymer comprising copolymerized units of:

A. from 25 to 60% by weight of styrene;

B. from 10 to 70% by weight of at least one ester of acrylic acid or methacrylic acid and

C. from 5 to 30% by weight of N-methylolalkyl ether of acrylic acid amide having from 1 to 4 carbon atoms in the alkyl ether moiety, N-methylolalkyl ether of methacrylic acid amide having from 1 to 4 carbon atoms in the alkyl ether moiety or a mixture thereof.

3,947,529

O-ETHYL-S-PROPYL-DITHIOPHOSPHORIC ACID PHENYL OR NAPHTHYL ESTERS

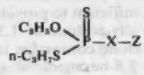
Shigeo Kishino, Tokyo; Akio Kudamatsu, Kanagawa; Iwao Takase, Tokyo; Kozo Shiokawa, Kanagawa, and Shin-Ichi Yamaguchi, Tokyo, all of Japan, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 123,087, March 10, 1971, Pat. No. 3,825,636. This application May 17, 1974, Ser. No. 471,082 Claims priority, application Japan, Mar. 13, 1970, 45-20845

Int. Cl.² A01N *9/36;* **C07F** *9/12*

U.S. Cl. 260—940 **6 Claims**

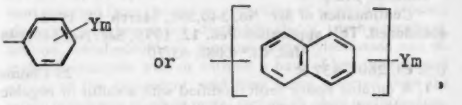
1. A phosphoric acid ester of the formula



in which

X is an oxygen or sulfur atom,

Z is a group of the formula



Y is a halogen atom or a lower alkyl, lower alkoxy, lower alkylmercapto, lower alkylsulfinyl, nitro, cyano or phenyl group, and at least one Y is lower alkoxy, lower alkylmercapto, lower alkylsulfinyl, nitro or cyano, and

m is 1 or 2.

3,947,530

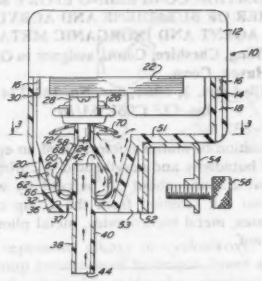
SELF-PRIMING CENTRIFUGAL PUMP

William Z. Marder, North Wales, Pa., assignor to Zevco Enterprises, Inc., Lansdale, Pa.

Filed Aug. 14, 1974, Ser. No. 497,444

Int. Cl.² B01F *3/04;* **F04D** *1/12*

U.S. Cl. 261—7 **19 Claims**



1. A centrifugal pump comprising:

a housing and a chamber having a substantially circular cross-section within said housing, the walls of said chamber tapering outwardly in a first direction;

a centrifugal impeller having an interior cavity with a substantially circular cross-section mounted for rotation within said chamber, said centrifugal impeller and said chamber being substantially concentric with each other, the walls of said cavity within said centrifugal impeller tapering in a second direction opposite to the direction of taper of the walls of said chamber;

a dish-shaped impeller substantially concentric with said centrifugal impeller and being mounted for rotation therewith, said dish-shaped impeller being mounted in a position remote from the smaller end of said chamber;

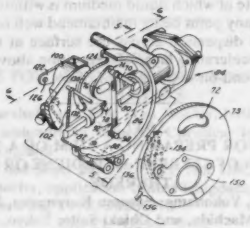
an inlet pipe extending from the exterior of said housing through the smaller end of said chamber and into the cavity of said centrifugal impeller; and at least one efflux port located within said housing.

3,947,531

CARBURETOR WITH CONTROLLED FAST IDLE CAM

Charles D. Branigin, Britton, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 23, 1974, Ser. No. 535,522
Int. Cl.² F02M 1/12
U.S. Cl. 261—39 B 1 Claim



1. A carburetor having an induction passage open at one end to air and adapted to be connected at its other end to the intake manifold of an internal combustion engine,

a spring closed throttle valve mounted for rotation across the passage to control flow of air and fuel therethrough,

an air movable choke valve unbalance mounted in the induction passage above the throttle valve and movable between a closed position and open positions by the flow of air thereagainst to control the air flow past the choke valve,

a rotatable fast idle cam having a cam surface operatively engageable by a lever rotatable with the throttle valve, the fast idle cam being journalled for a free rotation by gravity on a shaft on which is secured a choke lever connected to the choke valve, the choke lever having a one-way interconnection with the cam permitting free rotation of the choke lever relative to the cam in a choke valve opening direction while restricting rotation of the cam past the choke lever in the same direction,

a first chamber containing a bimetallic temperature responsive coiled spring connected to the choke valve lever biasing the choke valve closed and the fast idle cam in the same direction towards a highest fast idle position with a force that increases with decreases in temperature from a predetermined level,

engine temperature sensitive heating means adjacent the coiled spring for warming the spring as a function of changes in engine temperature level to permit progressive opening of the choke valve and movement of the fast idle cam towards a lower fast idle speed position,

a second chamber contiguous with the first chamber and having a common wall defined by a heat insulating gasket,

a second bimetallic temperature responsive spring cantilever mounted in the second chamber so as to be insulated from the heating means in the first chamber with the free end of the second spring flexibly projecting into the path of movement towards the lower fast idle speed position of a pin projecting from the fast idle cam so as to be engagable by the pin below predetermined temperature levels to restrict further movement of the pin and cam in the choke valve opening direction even though permitted by an opening movement of the choke valve and choke lever, to prevent engine stalling at lower temperature levels occasioned by an opening of the choke valve and throttle valve position than is dictated by the temperature conditions,

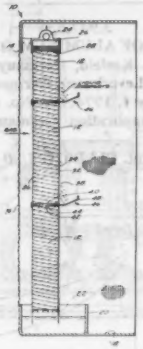
the second spring being movable from a first position at low temperatures projecting into the path of movement of the pin to a second position at higher temperatures withdrawn from the path of movement of the pin, and a heater element associated with the second spring heating the second spring and effecting a faster movement of the second spring from the first to second positions than would normally occur by exposure of the first spring to the engine temperature sensitive heating means or ambient temperature conditions alone.

3,947,532

LIQUID DISTRIBUTION STRIP

Jan O. Skold, Fort Myers, Fla., and Virendra Nath Kapoor, Amherst, N.Y., assignors to Buffalo Forge Company, Buffalo, N.Y. and Aktiebolaget Carl Munters, Sollentuna, Sweden, part interest to each

Filed June 17, 1974, Ser. No. 480,207
Int. Cl. B01d 47/00
U.S. Cl. 261—112 14 Claims



1. A gas and liquid contact apparatus comprising, in combination, at least one pair of generally vertically aligned contact bodies having pairs of generally vertically aligned and horizontally extending edge portions, the opposed adjacent horizontal edges of said bodies being located in slightly spaced relation to one another, said contact bodies having passageways formed therein penetrating between said two opposed vertical edges therein and the horizontal edges thereof being open to admit liquid into said passageways, and a liquid impervious distribution strip located between said opposed adjacent and spaced horizontal edges of the contact bodies and across one of said vertical edges, said strip extending generally horizontally inwardly of said one vertical edge a limited distance to cover only a limited edge portion of the horizontal edge of the contact body immediately thereabove, thereby to deflect liquid adjacent said one vertical edge towards the center of said contact apparatus in a direction towards the other of said vertical edges and directly into the contact body therebelow.

3,947,533

MAGNETIC FIELD EXPANSION AND COMPRESSION METHOD

Albert Roy Davis, Green Cove Springs, Fla., assignor to Bio-Magnetics, International Inc., Jacksonville, Fla.

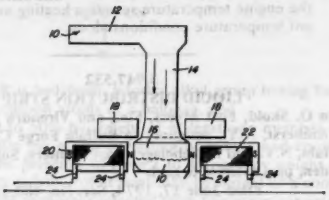
Filed June 14, 1974, Ser. No. 479,544
Int. Cl.² B22D 27/02
U.S. Cl. 264—24 11 Claims

1. A method for altering the physical properties of a material capable of assuming a molten, fluid state comprising the steps of:

heating said material to the molten state,

applying to said molten material magnetic energy in the range 1,000 to 1,000,000 gauss from only one magnetic pole for a time sufficient to achieve the desired alteration

in properties and



cooling said molten material to a solid state, said magnetic energy being applied prior to the passage of said material into its solid state form.

3,947,534

PROCESSING OF ALUMINUM OXIDE FIBERS

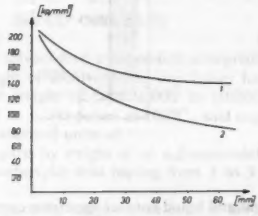
Manfred Mansmann, Krefeld, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 1, 1974, Ser. No. 465,952

Claims priority, application Germany, May 19, 1973, 2325575

Int. Cl.² D02G 3/00

U.S. Cl. 264—62 **8 Claims**



1. In the production of aluminum oxide fibers comprising dry spinning an aluminum compound-containing solution or sol to produce fiber and thereafter heat treating the fiber, the improvement which comprises applying to the fiber prior to heat treatment a solution of polyvinyl acetate in a solvent which is inert to the fiber.

3,947,535

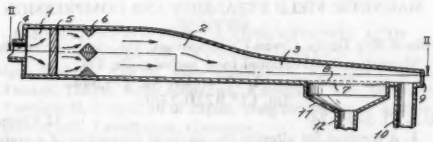
ALIGNING FIBRES

Greville Euan Gordon Bagg, Waltham Abbey; Henry Edwards, Harlow; Michael Ernest Newcombe Evans, Waltham Abbey; John Arnold Lewis, Hoddesdon, and Hans Ziebland, Hertford, all of England, assignors to National Research Development Corporation, London, England

Filed Apr. 12, 1974, Ser. No. 460,577

Int. Cl.² B29D 3/02; D21H 5/18

U.S. Cl. 264—87 **12 Claims**



1. A process for the production of a mat of aligned fibres, suitable for impregnating with a matrix to form a composite material, comprising (1) passing a continuous stream of a dispersion of fibres in a liquid medium from a dispersion supply source to and over the whole of a permeable surface, subjecting the stream of dispersion to continuous acceleration relative to the permeable surface as it progresses across the permeable surface, thereby generating a continuous stable aligning force to produce and maintain a uniform pattern of alignment of the fibres in the dispersion, and simultaneously (2) applying a pressure difference across the permeable surface to cause part of the liquid medium to pass through the permeable surface and leave a mat of aligned fibres on the said surface, the rate at which liquid medium is withdrawn through the surface at any point being maintainend well below the rate of flow of the dispersion across the surface at that point to maintain an accelerating layer of disposition above the surface and minimize end-on deposition of fibers.

3,947,536

PROCESS FOR PREPARING A FILM OF A TAPERED COPOLYMER OF STYRENE-BUTADIENE OR MIXTURES THEREOF

Shigeki Horlie, Yokohama; Susumu Kurematsu, Zama; Shinichiro Asai, Machida, and Chiaki Saito, Tokyo, all of Japan, assignors to Denki Kagaku Kogyo K.K., Tokyo, Japan

Continuation-in-part of Ser. No. 294,832, Oct. 4, 1972, Pat. No. 3,853,948. This application Apr. 17, 1974, Ser. No. 461,644

Claims priority, application Japan, Oct. 4, 1971, 46-77154

Int. Cl.² B29D 7/24; C08F 19/08

U.S. Cl. 264—95 **8 Claims**

1. A process for producing a film or sheet of a tapered styrene-butadiene copolymer which comprises:

melt extruding and then biaxially stretching at a temperature in the range of 60° – 180°C a tapered styrene-butadiene copolymer with a molecular weight of 40,000 – 250,000, a total styrene content of 50–90 wt. %, and a total butadiene content of 40 – 10 wt. %, wherein said tapered styrene-butadiene copolymer contains: (a) more than 5% of a chain portion with a tapering rate of 0.3 – 5 and a styrene content of 30 – 70 wt. %, (b) more than 35% of a chain portion with a styrene content of more than 80 wt. %, and (c) more than 10% of a chain portion with a styrene content from at least 5 wt. % to less than 50 wt. % between two high styrene content chain portions which have a styrene content greater than 80 wt. %.

3,947,537

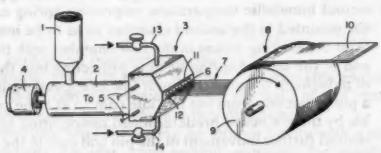
BATTERY SEPARATOR MANUFACTURING PROCESS

Robert R. Buntin, and Walter A. Morgan, both of Baytown, Tex., assignors to Exxon Research & Engineering Co., Linden, N.J.

Continuation of Ser. No. 163,207, July 16, 1971, abandoned. This application July 20, 1973, Ser. No. 381,104

Int. Cl.² B29D 27/00

U.S. Cl. 264—137 **5 Claims**



1. A method for producing a battery acid wettable nonwoven battery separator from nonwoven mats of polypropylene thermoplastic fibers, which mats before treatment are not wettable by at least a 35% sulfuric acid battery acid, which method comprises: wetting a nonwoven mat of said thermoplastic fibers with a surfactant-water solution at a temperature of 60° to 170° F., wherein said surfactant is cationic or nonionic and is present as a 0.2 to about 1.0 wt. % solution in said water by contacting only one side of said mat and permitting said solution to spread through said mat; vaporizing the water from the surfactantwater solution within said mat in a hot air countercurrent oven whereby said surfactant is evenly depos-

ited in an amount of 0.3 to 1.0% by weight based on fibers of said nonwoven mat which is now essentially dry; then heating said nonwoven mat to a temperature in excess of the softening point of said thermoplastic fibers but insufficient to melt, shrink or degrade said fibers; and subsequently compressing said heated nonwoven mat to a void fraction of at least 0.4.

3,947,538

PROCESS FOR UNIFORMILY DRAWING A TOW OF FILAMENTS

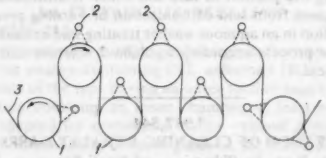
Geoffrey Marshall, and Eric Ivan Riseley, both of Harrogate, England, assignors to Imperial Chemical Industries, Ltd., London, England

Filed Sept. 29, 1971, Ser. No. 184,842

Claims priority, application United Kingdom, Oct. 22, 1970, 50260/70; Oct. 22, 1970, 50261/70

Int. Cl.² B29C *17/02*

U.S. Cl. 264—290 T **12 Claims**



1. A process for uniformly drawing a tow of filaments of a synthetic linear thermoplastic polymer having a second order transition temperature (Tg) as hereinafter defined of at least 35°C comprising passing a tow at least partly around the peripheries of a plurality of feed rolls in series and subsequently around a plurality of draw rolls in series the latter rotating at a higher peripheral speed, characterized in that substantially undrawn tow is initially passed to said feed rolls, spraying said tow while in contact with more than one of said feed rolls with a saturating amount of heated water at a temperature in the range Tg ± 10°C and drawing said tow to substantially the desired extent at said temperature before the tow leaves the last feed roll.

3,947,539

METHOD FOR COLD FORMING PLASTIC ARTICLE

Eckel R. Lane, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed July 10, 1972, Ser. No. 270,074

Int. Cl.² B29B *1/00*; B29C *17/03*

U.S. Cl. 264—320 **5 Claims**

1. In a process for cold forming a substrate of a sulfonateable polymer which can be cold formed wherein the substrate is positioned in a cold forming apparatus and formed into the desired shaped article at temperature below the heat-plastification point of the polymer; the improvement which comprises surface sulfonating the substrate of thermoplastic organic polymer to a degree sufficient to render the substrate surface water-wettable and subsequently cold forming the substrate to desired shape in the absence of lubricant.

3,947,540

METHOD FOR CURING TIRES, ESPECIALLY LARGE-SIZE TIRES

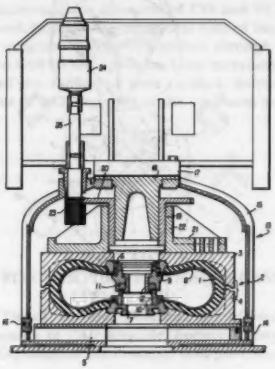
Mitsuo Hashimoto; Nobuo Kawakami, both of Kodairo; Kazuhiko Nakagawa, Kobe, and Yasuhiko Fujieda, Nishinomiya, all of Japan, assignors to Bridgestone Tire Company, Ltd., Tokyo and Kobe Steel, Ltd., Kobe, both of, Japan

Continuation-in-part of Ser. No. 192,275, Oct. 26, 1971, abandoned. This application Jan. 14, 1974, Ser. No. 433,306

Claims priority, application Japan, Oct. 26, 1970, 45-94974; Oct. 26, 1970, 45-94975

Int. Cl.² B29H *5/02*

U.S. Cl. 264—326 **5 Claims**



1. A method of curing tires comprising the steps of:

placing a mold unit, composed of upper and lower mold halves and containing a semi-shaped green tire, upon a stand of a mechanical press having a plunger mechanism supported, and capable of being moved by means of crank gear wheels and arms;

driving said crank gear wheels and arms to a first position located just ahead of their lower dead center position by a predetermined amount so as to continuously and smoothly move said plunger mechanism in an arcuate fashion from a raised position to a lowered position at which said plunger mechanism is located adjacent said upper mold half;

adjusting said plunger mechanism relative to said crank gear wheels and arms so that said plunger mechanism contacts and pressurizes said upper mold half with a compressive force and is loaded beyong a predetermined level, whereby said upper mold half is forced into contact with said lower mold half;

driving said crank gear wheels and arms to their lower dead center position so as to stress and compress said upper mold half still further into contact with said lower mold half through means of said plunger mechanism and thereby achieve an over-center type locking action; and

surrounding said mold unit with a steam atmosphere for the purpose of heating the mold and curing the tire.

3,947,541

SUBJECTING MATERIALS TO HIGH PRESSURE

Douglas Charles Barnes, Esher, England, assignor to National Research Development Corporation, London, England

Filed May 30, 1974, Ser. No. 474,607

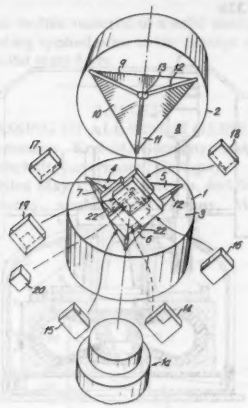
Int. Cl.² B30B *11/32*

U.S. Cl. 264—332 **6 Claims**

1. Apparatus to subject materials to high pressure comprising:

pressure sources mounted to converge upon a space and presenting working faces; a plurality of similar and movable anvils arrangeable in a cluster within this space;

the cluster completely defining an enclosed parallelepipedal volume to be filled by the material to be compressed; each anvil having side faces and opposed end faces; part of a first of the opposed end faces of each anvil defining a face of the enclosed parallelepipedal volume; the second and opposite end face of each anvil being in sliding contact with one of said working faces, whereby it may be acted upon by one of the pressure sources;



a plurality of the side faces of each anvil being in sliding contact with faces of adjacent anvils in the cluster, whereby the anvils by mutual sliding movement may converge upon the volume and reduce it by the same proportion in each of its linear dimensions, and the line of action of the resultant force of each anvil against its working face lying oblique to the planes of sliding motion of that anvil against adjacent anvils, whereby that force may be resolved into components urging that anvil into contact with the said adjacent anvils.

3,947,542
PROCESS FOR TREATMENT OF PYROCHLORE CONCENTRATES

Gaston Charlot, Paris, France, assignor to Societe Francaise D'Electrometallurgie, Paris, France

Filed Dec. 7, 1973, Ser. No. 422,668

Claims priority, application France, Dec. 8, 1972, 72.43692

Int. Cl.[2] B01D *11/00*

U.S. Cl. 423—18 **10 Claims**

1. A continuous process for treatment of niobium ore concentrates containing titanium, rare earth, thorium, iron and alkaline earth in addition to niobium to extract niobium, rare earths and thorium, comprising the steps of:

1. digesting the ore with a hot solution containing 13 to 16 moles of sulphuric acid per liter;
2. diluting the solution with aqueous medium to a concentration of 10.5 to 13 moles of sulphuric acid per liter to precipitate iron, alkaline earth and some of the rare earths as their sulphates;
3. separating the undigested residue and the precipitated sulphates from the solution;
4. reducing titanium in the solution from the tetravalent state to the trivalent state;
5. diluting the solution with aqueous medium to a concentration of 4 to 7 moles of sulphuric acid per liter to precipitate niobium oxide, and thorium and the remainder of the rare earths as their sulphates, leaving the tetravalent titanium in solution; and
6. separating the precipitate consisting essentially of niobium oxide and sulphates of thorium and rare earths.

3,947,543
PROCESS FOR RECOVERING COPPER AND NOBLE METALS FROM ORGANIC RESIDUES

Reinhold Thiel, Brig; Christoph Zinsstag, and Gunther Faschinger, both of Visp, all of Switzerland, assignors to Lonza, Ltd., Gampel. Valais, Switzerland

Filed Apr. 16, 1974, Ser. No. 461,278

Claims priority, application Switzerland, Apr. 19, 1973, 5717/73

Int. Cl.[2] C01G *55/00, 3/00;* **B01D** *15/06*

U.S. Cl. 423—22 **14 Claims**

1. A process for recovering copper and noble metals from an organic precipitate, residue or polymerizate which comprises subjecting the organic components containing the metals in the form of salts to a slow, low-temperature carbonization or burning process, without the use of any additional heat supplying elements, which does not use a temperature that destroys the metal salts and does not produce any insoluble oxides, the metal salts remaining in the ash resulting from the carbonization process, dissolving the portion of said ash remaining from said carbonization or burning process in an acid solution, said metal salts being in solution in said acid, and recovering the portion of said ash which is entrained in the exhaust gases from said carbonization or burning process by precipitation in an aqueous washer treating said exhaust gases.

14. The process according to claim 2 wherein said acid is sulfuric acid.

3,947,544
METHOD OF CLEANING EXHAUST GASES

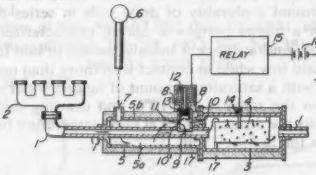
Mitsumasa Yamada, Shizuoka, and Youji Kitamura, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Division of Ser. No. 191,880, Oct. 22, 1971, abandoned. This application Dec. 18, 1973, Ser. No. 425,731

Claims priority, application Japan, Dec. 26, 1970, 46-140313

Int. Cl.[2] B01D *53/34*

U.S. Cl. 423—212 **1 Claim**



1. A method of catalytically treating and cleaning internal combustion exhaust gases comprising hydrocarbons and carbon monoxide while avoiding overheating and thermal destruction of the catalyst bed under operating conditions, said method including:

providing a catalyst-containing reaction area communicated to the exhaust gas conduit of an internal combustion engine;

supplying exhaust gases to the catalyst reaction area from an operating internal combustion engine;

supplying from a pumping means secondary air in contact with the heated exhaust conduit of the engine and heating the secondary air prior to introduction into the catalyst reaction area;

directing the heated secondary air into the catalyst reaction area together with the exhaust gases causing the hydrocarbons and carbon monoxide components of the exhaust

gases to be oxidized by the catalyst to carbon dioxide and water, and discharging the reaction products, including the cleaned and heated exhaust gases, to the atmosphere;

discontinuing the supply of heated secondary air to the catalyst reaction area while continuing the supply of secondary air in contact with the heated exhaust conduit and discharging this heated air directly to the atmosphere when the temperature of the catalyst reaches a predetermined temperature prior to thermal destruction of the catalyst, causing the exhaust gases passing into the catalyst reaction area to be cooled and substantially or completely discontinue the catalytic reaction occurring in the reaction area, thereby effectively reducing the temperature of the catalyst bed; and

continuing to supply the heated secondary air to the catalyst reaction area when the catalyst bed has returned to the temperature below the predetermined temperature.

3,947,545
PURIFICATION OF EXHAUST GAS

Yasuhiko Ishida; Nobuaki Wakita, and Masato Yokota, all of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Oct. 2, 1973, Ser. No. 402,729

Claims priority, application Japan, June 20, 1973, 48-69507; June 20, 1973, 48-69508

Int. Cl.² F01N *3/14*; B01D *53/00*

U.S. Cl. 423—213.7 **7 Claims**

1. An apparatus for purifying exhaust gases from an internal combustion engine containing CO, unburned HC, and NO_x components of the type having an outer shell of heat insulated construction enclosing an inner chamber, at least one inlet conduit adapted for connection to the exhaust ports of the engine for introducing exhaust gases to the inner chamber, and an outlet conduit for discharging the resulting purified gases from the chamber,

a heat conductive baffle positioned within the inner chamber for dividing the inner chamber into an upstream reduction zone having at least one surface composed of a catalytic material for promoting reduction of the NO_x components in the exhaust gases and communicating with the inlet conduit, and a substantially unobstructed downstream thermal, flame-type oxidation zone having an inlet region communicating with the upstream zone and an outlet region communicating with the outlet conduit, and

an injection conduit extending through the outer shell and having an outer end adapted for connection to a source of air and an inner end positioned to inject air from said source into the exhaust gases passing from the upstream zone into the downstream zone in sufficient quantity to create an oxygen-rich mixture in the downstream zone, wherein the improvement comprises:

the surfaces of the heat conducting baffle that are exposed to the exhaust gases in the upstream and downstream zones being composed of material having dual reducing and oxidizing cataltyic activities for reducing the NO_x components of the exhaust gases in the upstream zone and for augmenting the thermal, flame-type oxidation of CO and HC components of the exhaust gases in the interior of the downstream zone by catalytic no-flame oxidation adjacent to the baffle surface, thereby increasing the amount of CO and HC components that are oxidized in the downstream zone and thus increasing the heat generated by the oxidizing reactions in the downstream zone, this additional heat being transferred through the baffle to increase the catalytic reducing reaction in the upstream zone and to shorten the warmup time.

5. A method of purifying exhaust gases containing CO, unburned HC, and NO_x components of the type that includes the successive steps of feeding a rich reducing mixture of hot exhaust gases into an upstream zone in a heat insulated chamber, the upstream zone including exposed surfaces composed of an alloy with reducing catalytic properties, the temperature in the upstream zone being high enough to cause catalytic reduction of the NO_x components in the exhaust gases; passing the resultant gases from the upstream zone to a substantially unobstructed downstream zone in the chamber on the other side of a heat conductive wall separating the upstream and downstream zones; and adding air to the resultant gases as they enter the downstream zone in an amount sufficient to form a rich oxidizing gas mixture to cause thermal flame-type oxidation of the CO and unburned HC components in the downstream zone, wherein the improvement comprises:

providing the heat conductive wall with surfaces composed of a catalytic material having dual reducing and oxidizing properties so that the thermal oxidation of CO and HC in the downstream zone will be augmented by catalytic oxidation adjacent to said wall in the downstream zone, thereby increasing the amounts of CO and HC that are oxidized and, because the additional heat of the catalytic oxidation reaction being transmitted through the heat conductive wall to the upstream zone increases the temperature of the reduction zone catalyst, increasing also the amount of NO_x reduced in the upstream zone.

3,947,546
PROCESS FOR THE PURIFICATION OF GASEOUS EFFLUENTS

Jean Louise, Villejuif, and Guy Senechal, Saint Cloud, both of France, assignors to l'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed May 25, 1973, Ser. No. 364,034

Claims priority, application France, May 31, 1972, 72.19426

Int. Cl.² C01B *17/00*

U.S. Cl. 423—242 **10 Claims**

1. A process for purifying gaseous effluent containing sulfur dioxide, comprising the steps of:

a. oxidizing, in a first stage, by means of ozonized oxygen containing from 1–3% ozone, a solution consisting essentially of sulphuric acid with a concentration in the range of 10–40% containing an amount of a salt of iron or manganese sufficient to catalyze the oxidation of sulphur dioxide;

b. recycling the oxygen remaining after step (a) for ozonization;

c. oxidizing, in a second stage, the greater portion of the sulphur dioxide into sulphur trioxide by bringing the gaseous effluent containing sulphur dioxide into contact with the oxidized solution of sulphuric acid from step (a), the rate of flow of the gaseous effluent to that of the oxidized solution of sulphuric acid being between 1000:1 and 50:1, and the period of contact between the gaseous effluent and the oxidized sulphuric acid being in the range of from about 0.5 to about 3 seconds;

d. recycling part of the sulphuric acid which has lost its oxidizing potential and which remains after step (c) into the oxidizing step (a);

e. concentrating to 90–95% another part of the sulphuric acid which has lost its oxidizing potential and which remains after step (c) by counter-current heat exchange with the gaseous effluent before the latter has been desulphurized;

f. separating the greater part of the catalyst entrained in the concentrated sulphuric acid after said step (e) by crystallization and decantation at ambient temperature: and

g. recycling said catalyst to the sulphuric acid used in said step (a); and

wherein the amount of ozone employed in said ozonized oxygen is 1 mole per 15–20 moles of sulphur dioxide.

3,947,547

PROCESS FOR REDUCING TOTAL SULFUR CONTENT OF CLAUS OFF-GASES

Willem Groenendaal; Heinz-Gerhard A. Kock, and Philippus Loof, all of The Hague, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 13, 1973, Ser. No. 424,251

Claims priority, application United Kingdom, Dec. 15, 1972, 58026/72; Netherlands, July 3, 1973, 7309230

Int. Cl.² C01B *17/00, 17/02*

U.S. Cl. 423—242 3 Claims

1. In a process for decreasing the total sulfur content of off-gases from a Claus process wherein the sulfur dioxide-containing off-gases are heated to a temperature in excess of about 175°C by mixing with the hot gaseous product of the combustion of a carbonaceous fuel with an oxygen-containing gas in a line burner, and the Claus off-gases, so heated, are passed together with a hydrogen-containing gas over a reduction catalyst at a temperature above 175°C to reduce the sulfur dioxide and other convertible sulfur compounds present to hydrogen sulfide followed by removal of the hydrogen sulfide from the gaseous stream by adsorption on an absorbent or adsorbent for hydrogen sulfide, the improvement which comprises; introducing hydrogen-containing gas in a quantity which is required to convert at least 10 percent of the oxygen in the oxygen-containing gas supplied to the line burner directly into the line burner at a point where the temperature of the gaseous product of combustion is sufficiently high to support spontaneous combustion between the hydrogen and excess oxygen present in the combustion product.

3,947,548

PROCESS OF GROWING SINGLE CRYSTALS OF GALLIUM PHOSPHIDE

Jun-Ichi Nishizawa; Ken Suto, and Yasuo Okuno, all of Sendai, Japan, assignors to Semiconductor Research Foundation, Japan

Continuation-in-part of Ser. No. 182,769, Sept. 22, 1971, abandoned. This application Aug. 28, 1973, Ser. No. 392,190

Claims priority, application Japan, Oct. 1, 1970, 45-86521

Int. Cl.² C01B *25/00*

U.S. Cl. 423—299 3 Claims

1. A process of producing single crystals of substantially gallium phosphide from a melt containing indium as the solvent, which process comprising heating a mixture of indium, gallium and phosphorus to form a melt and thereafter slowly cooling the melt to room temperature, wherein the melt has an atomic ratio of gallium to phosphorus equal to at least 2.5 to produce said single crystals including at most 0.5 atomic percent of indium.

3,947,549

PREPARATION OF INDIUM PHOSPHIDE

Peter Jeremy Born, Ledbury, and Daniel Stewart Robertson, Malvern, both of England, assignors to British Secretary of State for Defence, London, England

Filed Mar. 12, 1974, Ser. No. 450,507

Claims priority, application United Kingdom, Mar. 15, 1973, 12934/73

Int. Cl.² C01B *25/00*

U.S. Cl. 423—299 10 Claims

1. A method of preparing indium phosphide by reacting together a hydride of phosphorus with a halide of indium comprising the steps of providing a reflux vessel for establishing a liquid-vapour reflux, said vessel having a receptacle for collection of solid material formed by chemical reaction in the vapour of said reflux, introducing a charge of said halide into said vessel, heating said vessel to provide a continuous reflux of said halide, the temperature of the vapor of said halide in said reflux being in the inclusive range of from 400° to 750°C, directing a controlled gaseous flow containing said hydride at a flow rate in the inclusive rate of between 30 and 70 cm^3 per minute into said halide vapour, and collecting the product of reaction between said halide vapour and said hydride on said receptacle.

3,947,550

METHOD OF MAKING A SILICON CARBIDE ARTICLE OF LESS THAN FULL DENSITY

Douglas R. Fitchmun, Bloomfield Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Aug. 20, 1973, Ser. No. 389,760

Int. Cl.² C01B *31/36*

U.S. Cl. 423—345 11 Claims

2. A method of making a silicon carbide article which comprises the steps of:

1. mixing (a) 26 to 58 parts by weight of silicon carbide particles having a size less than about 80 microns, (b) 44 to 26 parts by weight of silicon particles of less than about 180 microns, and (c) 30 to 17 parts by weight of a thermosetting, polymeric material which (i) originally contains aromatic components or produces such aromatic components upon pyrolysis and (ii) is in a flowable, liquid phase at temperatures of a plastic molding operation;
2. injection molding said mixture formed in step 1, said injection molding carried out by (a) preheating said mixture to a temperature whereat said polymeric material is in a liquid phase, (b) introducing said heated mixture into a mold for an injection molding process, (c) filling said mold with said introduced mixture, and (d) developing a uniform, constant pressure throughout said mixture within said mold thereby to develop a matrix of said polymeric material throughout said mold with a greater amount of said polymeric material near the surface of said mold;
3. stiffening said mixture introduced into said mold to form a molded article, said stiffening of said mixture being accomplished by cross linking said thermosetting, polymeric material to at least a degree sufficient to permit said molded article to be removed from said mold without substantial distortion thereof;
4. pyrolyzing said polymeric material of said molded article to produce a porous body in which said silicon carbide particles and silicon particles are bonded together by substantially pure carbon; and
5. siliciding said porous body produced in step 4 with said silicon particles of said body by heating said body in a suitable atmosphere to a temperature at which said silicon particles melt to form liquid silicon which reacts with said carbon thereby to form a finished article of substantially pure silicon carbide, which article has a dense skin and a porous core.

3,947,551

AMMONIA SYNTHESIS

Roger W. Parrish, Pittsburgh, Pa., assignor to The Benfield Corporation, Berwyn, Pa.

Filed May 29, 1974, Ser. No. 474,232

Int. Cl.² C01C *1/04*

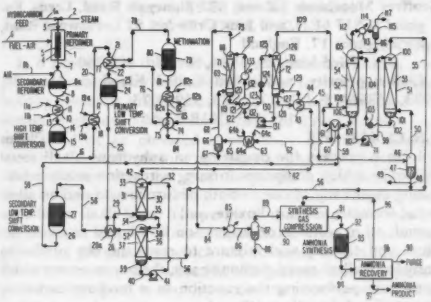
U.S. Cl. 423—359 12 Claims

1. In a process for the synthesis of ammonia from a hydrocarbon starting material involving the steps of generating under superatmospheric pressure a mixture comprising carbon monoxide and hydrogen from said hydrocarbon, converting the carbon monoxide in said mixture to hydrogen and CO_2 by reaction with water through catalytic shift conversion, removing said CO_2 from said mixture by absorption in a liquid scrubbing medium which is regenerated by steam stripping, converting residual CO and CO_2 to methane by reaction with hydrogen over a methanation catalyst, compressing said hydrogen together with nitrogen in about the molar ratio required for ammonia synthesis, passing said compressed mixture over an ammonia synthesis catalyst, recycling unconverted synthesis gas to the ammonia synthesis catalyst, and purging sufficient gas from the recycle stream to maintain a desired concentration of methane and other inerts in the

stream flowing to the ammonia synthesis catalyst, a method for minimizing hydrogen losses in the methanation step and hydrogen and ammonia losses in the purge step while at the same time minimizing the steam required by such CO_2 removal and CO shift conversion steps which comprise the steps of:

a. Converting from 90 to 99% of the carbon monoxide in said carbon monoxide-hydrogen mixture to hydrogen and CO_2 by reaction of said carbon monoxide with water in at least two successive catalytic shift conversion zones, the last of which operates in the temperature range of from 350° to 550°F;

b. Removing carbon dioxide from the mixture produced in Step (a) in a first CO_2 scrubbing zone to provide a gas mixture containing not more than about 2% and not less than about 0.1% CO_2, the CO_2 removal in said first zone being carried out by contacting said mixture with a scrubbing solution comprising an aqueous solution of potassium carbonate, wherein at least the major portion of said scrubbing is carried out at a scrubbing solution temperature in the vicinity of the atmospheric boiling temperature of said solution, and wherein the regeneration of said scrubbing solution is carried out at a reduced pressure by steam stripping thereof, whereby the bulk of said CO_2 is removed with a minimum consumption of stripping steam;



c. Subjecting the gas mixture produced in Step (b) to catalytic shift conversion at a temperature in the range of from 350° to 550°F to convert residual carbon monoxide to hydrogen and carbon dioxide to produce a gas stream containing not more than 0.1% residual carbon monoxide;

d. Removing CO_2 from the gas mixture produced in Step (c) in a second CO_2 scrubbing zone to provide a mixture containing not more than about 200 ppm of residual CO_2, the CO_2 removal in said second zone being carried out by contacting said gas mixture with a scrubbing solution comprising an aqueous solution of an alkaline chemical absorbent wherein said scrubbing is carried out at an absorption temperature of from 90° to 140°F permitting the reduction of residual CO_2 in said mixture at least to said level of 200 ppm and wherein the regeneration of said scrubbing solution is carried out by steam stripping thereof;

e. Converting the residual carbon monoxide and carbon dioxide in the gas mixture from Step (d) to methane in a catalytic methanation zone, and thereafter introducing said gas mixture into an ammonia synthesis loop including a purge for preventing the build-up of inert gases in said loop.

3,947,552

PROCESS FOR THE PURIFICATION OF CYANOGEN CHLORIDE

Friedhelm Geiger; Werner Heimberger, and Gerd Schreyer, all of Hanau, Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

Filed Dec. 6, 1974, Ser. No. 530,611

Claims priority, application Germany, Dec. 21, 1973, 2363866

Int. Cl.² C01B *21/18*

U.S. Cl. 423—379 **13 Claims**

1. A process of purifying impure cyanogen chloride gas prepared by the reaction of hydrogen cyanide with chlorine comprising passing the impure cyanogen chloride over granular sodium aluminum silicate or a mordenite molecular sieve at 20° to 100°C.

3,947,553

PROCESS FOR PREPARING PURE BARIUM NITRATE CRYSTALS

Robert H. Moss, Cleveland Heights, and William F. Spicuzza, Eastlake, both of Ohio, assignors to The Harshaw Chemical Company, Cleveland, Ohio

Filed June 7, 1974, Ser. No. 477,508

Int. Cl.² C01F *11/36, 11/38, 11/44, 11/22*

U.S. Cl. 423—395 **6 Claims**

1. A wet process for preparing essentially pure barium nitrate from relatively pure barium nitrate having a salt of calcium or strontium element present as an impurity, said relatively pure barium nitrate being at least 99.5 per cent pure, comprising, forming an aqueous solution of said relatively pure barium nitrate, adding concentrated nitric acid to said aqueous solution to yield an acid solution having an acid concentration in the range from about 10 to about 15 percent HNO_3 by weight, maintaining said acid solution at a sufficiently low temperature at about room temperature or below, and recovering said essentially pure barium nitrate in which either calcium or strontium element is coprecipitated as a salt in a concentration smaller than the concentration of either calcium or strontium element present in the mother liquor separated from said essentially pure crystals, by a reduction factor in the range from about 5 to about 500.

3,947,554

CATALYTIC OXIDATION OF AMMONIA

Michel Senes, Saint Nazaire; Pierre Lhonore, Douai; Michel Pottier, Saint Nazaire, and Jacques Quibel, Maisons Laffitte, all of France, assignors to Societe Chimique de La Grande Paroisse et Produits Chemiques, Paris, France

Continuation of Ser. No. 112,879, Feb. 5, 1971, abandoned. This application Feb. 6, 1974, Ser. No. 440,268

Claims priority, application France, Feb. 9, 1970, 70.04454

Int. Cl.² C01B *21/26*

U.S. Cl. 423—403 **19 Claims**

1. In a method for the catalytic oxidation of ammonia comprising passing a mixture of ammonia and air over a catalyst under ammonia oxidation conditions, the improvement wherein said catalyst comprises:

a composition of limited porosity, with a specific surface area between 0.02 and $2m^2/g$, wherein said composition consists essentially of 0.1–10% of an active material selected from the group consisting of the metals of the platinum group, and a refractory oxide carrier comprising, in the composition, 10–60% magnesia, 0.2 to 10% silica and 5–50% zirconia, all combined by mixing said active material and said carrier in powdered form, compressing at 1,000–10,000 bars pressure and sintering at 1300° C. or higher.

3,947,555

PROCESS FOR THE RECLAMATION OF UNCEMENTED TUNGSTEN CARBIDE POWDERS

Martin B. MacInnis, and Clarence D. Vanderpool, both of Towanda, Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Oct. 23, 1973, Ser. No. 408,493
Int. Cl.² C01B 31/34
U.S. Cl. 423—440 4 Claims

1. A process suitable for recovering refractory metal carbides comprising:

a. forming an admixture containing uncemented tungsten carbide powder contaminated with at least one iron group metal and glacial acetic acid wherein the weight of said powders divided by the weight of said acid is a numerical value less than about 5;

b. maintaining said admixture at its boiling point for at least about 30 minutes;

c. separating the resulting solids from said acid; and

d. removing the residual acid from said solids.

3,947,556

ZINC COMPLEXES OF BASIC ALUMINUM CHLORIDES AND METHODS OF MAKING SAME

John L. Jones, North Plainfield; Andrew M. Rubino, New Providence, both of N.J., and Charles B. Lindahl, Sand Springs, Okla., assignors to Armour Pharmaceutical Company, Chicago, Ill.

Division of Ser. No. 164,434, July 20, 1971. This application June 3, 1975, Ser. No. 583,370
Int. Cl.² C01G 25/04; C01F 7/00; C01G 9/00, 25/00
U.S. Cl. 423—463 9 Claims

1. A method of preparing alcohol soluble solid complexes of five-sixths basic aluminum chlorides comprising the steps of providing an aqueous solution of five-sixths basic aluminum chloride having the general empirical formula:

$$Al_2(OH)_{6-x}Cl$$

in which x equals about 0.9 to 1.2; adding to said aqueous solution a substance selected from the group consisting of zinc chloride, zinc bromide and combinations of said zinc halides which zirconyl bromide and/or zirconyl hydroxybromide; and drying the resulting mixture to a substantially friable solid.

3,947,557

ZINC COMPLEXES OF BASIC ALUMINUM BROMIDES AND METHODS OF MAKING SAME

John L. Jones, North Plainfield; Andrew M. Rubino, New Providence, both of N.J., and Charles B. Lindahl, Sand Springs, Okla., assignors to Armour Pharmaceutical Company, Chicago, Ill.

Division of Ser. No. 164,433, July 20, 1971. This application June 3, 1975, Ser. No. 583,381
Int. Cl.² C01G 25/04; C01F 7/00, 7/48; C01G 9/04
U.S. Cl. 423—463 9 Claims

1. A method of preparing alcohol soluble solid complexes of five-sixths basic aluminum bromides comprising the steps of providing an aqueous solution of five-sixths basic aluminum bromide having the general empirical formula:

$$Al_2(OH)_{6-x}Br_x$$

in which x equals about 0.9 to 1.2; adding to said aqueous solution a substance selected from the group consisting of zinc chloride, zinc bromide, and combinations of either or both of said zinc halides with zirconyl chloride, zirconyl bromide, zirconyl hydroxychloride and/or zirconyl hydroxybromide; and drying the resulting mixture to a substantially friable solid.

3,947,558

METHOD OF RECOVERING HF FROM MIXTURES CONTAINING C_1–C_3 HALOCARBON COMPOUNDS

A. Theodorus van Eijl, Terneuzen, Netherlands, assignor to Dow Chemical (Nederland) B.V., Terneuzen, Netherlands

Filed Aug. 16, 1973, Ser. No. 389,101
Int. Cl.² C01B 7/22; B01D 3/14
U.S. Cl. 423—483 9 Claims

1. A method of recovering the HF which is dissolved in the organic layer obtained after fluorinating a C_1–C_3 chlorinated hydrocarbon and after separating HCl and cooling to form an HF rich layer and said organic layer, comprising commingling (a) the substantially HCl free organic C_1–C_3 halocarbon layer containing chloro-, chlorofluoro-, and fluorocarbons with (b) a glycol lean in HF and which is liquid at the temperature employed and which has from 2 to 8 C atoms, forming a glycol layer having hydrogen fluoride selectively dissolved therein and a C_1–C_3 halocarbon layer containing chloro-, chlorofluoro- and fluorocarbons, separating the C_1–C_3 halocarbon layer from the glycol layer and recovering hydrogen fluoride from the glycol layer.

3,947,559

ALKALI METAL DITHIONITE MANUFACTURE

Geoffrey Moorhouse Gibson, 623 Stonegate Road, Leeds, England (LS17 6EJ), and John Crowder, 82 Lordswood Road, Birmingham 17, England

Filed Mar. 29, 1974, Ser. No. 455,980
Claims priority, application United Kingdom, Mar. 30, 1973, 15386/73; July 17, 1973, 33969/73
Int. Cl.² C01B 17/66
U.S. Cl. 423—515 17 Claims

1. In a process for preparing an anhydrous alkali metal dithionite which comprises forming a reaction mixture consisting essentially of one or both of formic acid and an alkali metal formate, sulphur dioxide, and a basic alkali metal compound, all in solution or suspension in a liquid reaction medium and causing said mixture to react thereby producing anhydrous alkali metal dithionite salt, the improvement which comprises performing the reaction in a medium consisting essentially of 2-methoxyethanol.

3,947,560

PROCESS FOR OXIDIZING SULFUR DIOXIDE

Masao Nambu, Kawasaki; Syunichi Yamamoto, and Hideo Machida, both of Yokohama, all of Japan, assignors to Nippon Oil Company, Ltd., Tokyo, Japan

Filed Mar. 5, 1974, Ser. No. 448,256
Claims priority, application Japan, Mar. 15, 1973, 48-29454; Mar. 15, 1973, 48-29455; Mar. 16, 1973, 48-29933
Int. Cl.² C01B 17/72, 17/60
U.S. Cl. 423—522 4 Claims

1. In a process for removing sulfur dioxide from a gas stream containing the same prior to passing said gas stream to the ambient atmosphere by converting the sulfur dioxide in a low temperature, liquid phase, catalytic reaction to sulfuric acid, the improvement comprising contacting the sulfur dioxide containing gas stream and a gas containing oxygen with an acidic aqueous solution containing from 3 ppm to 8000 ppm of pentavalent vanadium ion and from 3 to 200 ppm of a divalent manganese ion at a temperature in the range of 0° to 100°C and continuing said contact until the concentration of sulfuric acid in said aqueous solution reaches up to 55% by weight.

3,947,561

METHOD OF REMOVING MERCURY FROM SULFURIC ACID

Alan Douglas Zunkel, Aliquippa, Pa., assignor to St. Joe Minerals Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 402,790, Oct. 2, 1973, abandoned. This application June 14, 1974, Ser. No. 479,552

Int. Cl.² C01B *17/90*

U.S. Cl. 423—531 1 Claim

1. A method of removing mercury from concentrated sulfuric acid which comprises treating the sulfuric acid with finely divided aluminum in an amount substantially in excess of one atom of aluminum for each atom of mercury present in the sulfuric acid agitating the mixture, then, cooling the acid to a temperature not exceeding about 15°C but above the freezing point of the acid and filtering the acid in from about 1 to 6 hours after adding the aluminum.

3,947,562

PRODUCTION OF A FORM OF ALUMINA WHISKERS

Rex William Grimshaw, Rawdon near Leeds, England, and John Gilleran Peacey, Pointe Claire, Canada, assignors to Hepworth & Grandage Limited, England

Filed Apr. 4, 1975, Ser. No. 565,263

Int. Cl.² C01F *7/02*

U.S. Cl. 423—630 15 Claims

1. A process for the production of alumina whiskers comprising contacting an intimate mixture of particulate alumina-bearing material and a particulate form of carbon with a stream of gaseous aluminium trihalide in a first reaction zone maintained at an elevated temperature at which reaction occurs to form aluminium monohalide and and carbon monoxide, transporting the gaseous products comprising said monohalide and carbon monoxide to a second reaction zone maintained at a lower temperature than said first reaction temperature, this said lower temperature being one at which reversal of the reaction which has occurred in said first reaction zone occurs with formation of a gaseous stream supersaturated with respect to alumina under the conditions prevailing in the second reaction zone and deposition of the desired whisker form of alumina.

3,947,563

HYDROGENOLYSIS OF FORMATES

Edward F. Dougherty, Corpus Christi, Tex., assignor to Celanese Corporation, New York, N.Y.

Filed Oct. 7, 1974, Ser. No. 512,598

Int. Cl.² C01B *13/14*; C01D *1/00*; C07C *29/00*

U.S. Cl. 423—636 11 Claims

1. A process for hydrogenolysis of an alkali metal or alkaline earth metal salt of formic acid, which process comprises: in a reaction zone contacting a liquid phase solution of said salt of formic acid with hydrogen in contact with a catalyst having a catalytically active surface consisting essentially of metallic cobalt, rhenium, ruthenium, palladium, or platinum or mixtures thereof, said reaction zone being maintained at elevated temperatures and pressures sufficient to cause reaction of said salt of formic acid with said hydrogen to form methanol and a hydroxide of said alkali metal or alkaline earth metal, and withdrawing the reaction products from said reaction zone and separating said hydroxide therefrom.

3,947,564

RADIOACTIVE DETERMINATION OF SERUM THYROXINE

Charles F. Shannon, Concord, and Robert V. Dahlstrom, San Rafael, both of Calif., assignors to Bio-Rad Laboratories, Richmond, Calif.

Filed May 29, 1973, Ser. No. 364,564

Int. Cl.² G01N *33/00*; G01T *1/16*

U.S. Cl. 424—1 10 Claims

1. In the determination of thyroxine ("T-4") in blood serum including the steps of separating T-4 from serum, competitively binding a portion of said separated T-4 with thyroxine binding material in the presence of a known amount of radioactive T-4, separating radioactive T-4 bound by said thyroxine binding material from unbound radioactive T-4, and measuring the amount of bound or unbound radioactive T-4 whereby serum T-4 concentration may be determined therefrom, the improvement comprising: executing said step of separating T-4 from serum by contacting the serum with an effective amount of a montmorillonite clay under acidic conditions to adsorb the serum T-4 thereon, separating said montmorillonite clay from said serum, and then separating adsorbed T-4 from said clay, by introducing said clay into an alkaline solution, whereby said T-4 is freed from said clay.

3,947,565

ANTI-ARTHRITIC COMPOSITIONS COMPRISING S-HETEROCYCLIC DERIVATIVES OF PHOSPHINE OR PHOSPHITE GOLD MERCAPTIDES AND METHODS OF PRODUCING ANTI-ARTHRITIC ACTIVITY

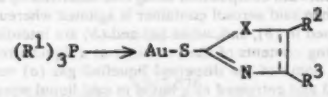
Blaine M. Sutton, Hatboro, and Joseph Weinstock, Phoenixville, both of Pa., assignors to Smithline Corporation, Philadelphia, Pa.

Division of Ser. No. 384,666, Aug. 1, 1973, Pat. No. 3,883,546. This application Jan. 22, 1975, Ser. No. 542,976

Int. Cl.² A61K *31/675*

U.S. Cl. 424—200 14 Claims

1. A pharmaceutical composition having anti-arthritic activity, in dosage unit form, comprising a pharmaceutical carrier and an effective but nontoxic amount of a compound of the formula:



in which:

R^1 is lower alkyl, lower alkoxy, phenyl or phenoxy, with each alkyl or alkoxy having from one to three carbon atoms;

X is S, NH, NCH_3 or O;

R^2 and R^3 are hydrogen or together form a 1,2-benzo radical; and

indicates an optional double bond.

3,947,566

EFFERVESCENT MEDICAMENTS

Edward J. Sarna, Yonkers; Norman H. Ishler, Valley Cottage, both of N.Y., and Joseph Jellema, Prospect Park, N.J., assignors to Phoenix Research Inc., Las Vegas, Nev.

Continuation of Ser. No. 60,751, Aug. 3, 1970, abandoned, which is a continuation-in-part of Ser. No. 689,278, Dec. 11, 1967, abandoned. This application Jan. 4, 1974, Ser. No. 430,908

Int. Cl.² A61K *9/00*

U.S. Cl. 424—45 8 Claims

1. An effervescing medicament composition confined under pressure in an aerosol dispensing container,

said medicament composition consisting essentially of (a) a liquefied gas having a boiling point of from about −50°F.

to about 80°F. and an aqueous or alcoholic phase (b) containing a medicament selected from the group consisting of a cough preparation, an analgesic and a stomach alkalizer and being substantially free of an agent capable of emulsifying the liquefied gas (a) in said phase (b), said phase (b) being substantially non-soluble with (a) and being dispersible with (a) with agitation thereof, liquefied gas (a) having a density greater than (b) and the quantity of (a) being at least about 5 percent by weight in excess of the quantity required to propel (b) from said container,

said medicament composition being characterized by effervescence when said aerosol container is agitated whereupon (a) is dispersed in (b), and, while (a) and (b) are interdispersed, discharging contents of the container as a liquid stream into a vessel, some of the dispersed liquefied gas (a) remaining dispersed and entrained as a liquid in said liquid stream after the contents leave the container.

3,947,567

EFFERVESCENT CLEANSERS

Robert C. Berg, Jr., Bronx; Norman H. Ishler, Valley Cottage, both of N.Y., and Joseph Jellema, Prospect Park, N.J., assignors to Phoenix Research Inc., Las Vegas, Nev.

Continuation of Ser. No. 60,750, Aug. 8, 1970, abandoned, which is a continuation-in-part of Ser. No. 689,292, Dec. 11, 1967. This application Jan. 4, 1974, Ser. No. 430,618

Int. Cl.² C11D *17/00*; A61L *9/04*; A61K *7/16*

U.S. Cl. 424—45 **4 Claims**

1. An effervescing mouthwash composition confined under pressure in an aerosol dispensing container,

said mouthwash composition consisting essentially of (*a*) a liquefied gas having a boiling point of from about −50° F. to about 80° F. and an aqueous phase (*b*) containing a mouthwash and being substantially free of an agent capable of emulsifying the liquefied gas in said phase (*b*), said phase (*b*) being substantially non-soluble with (*a*) and being dispersible with (*a*) with agitation thereof, liquefied gas (*a*) having a density greater than (*b*) and the quantity of (*a*) being at least about 5 percent by weight in excess of the quantity required to propel (*b*) from said container,

said mouthwash composition being characterized by effervescence when said aerosol container is agitated whereupon (*a*) is dispersed in (*b*), and, while (*a*) and (*b*) are interdispersed, discharging contents of the container as a liquid stream into a vessel, some of the dispersed liquefied gas (*a*) remaining dispersed and entrained as a liquid in said liquid stream after the contents leave the container.

3,947,568

EFFERVESCENT COSMETIC COMPOSITIONS

Barstow Bates, Old Greenwich, Conn., and Norman H. Ishler, Valley Cottage, N.Y., assignors to Phoenix Research Inc., Las Vegas, Nev.

Continuation of Ser. No. 60,762, Aug. 3, 1970, abandoned, which is a continuation-in-part of Ser. No. 689,351, Dec. 11, 1967, abandoned. This application Jan. 4, 1974, Ser. No. 430,617

Int. Cl.² A61K *9/00*, *9/04*

U.S. Cl. 424—47 **9 Claims**

1. An effervescing cosmetic composition confined under pressure in an aerosol dispensing container,

said cosmetic composition consisting essentially of (a) a liquefied gas having a boiling point of from about −50°F. to about 80°F. and an aqueous or alcoholic phase (b) containing a liquid cosmetic and being substantially free of an agent capable of emulsifying the liquefied gas (a) in said phase (b), said phase (b) being substantially non-soluble with (a) and being dispersible with (a) with agitation thereof, liquefied gas (a) having a density greater than (b) and the quantity of (a) being at least about 5 percent by weight in excess of the quantity required to propel (b) from said container,

said cosmetic composition being characterized by effervescence when said aerosol container is agitated whereupon (a) is dispersed in (b), and, while (a) and (b) are interdispersed, discharging contents of the container as a liquid stream into a vessel, some of the dispersed liquefied gas (a) remaining dispersed and entrained as a liquid in said liquid stream after the contents leave the container.

3,947,569

PROCESS FOR PREPARING THE RELEASING HORMONE OF LUTEINIZING HORMONE (LH) AND OF FOLLICLE STIMULATING HORMONE (FSH), SALTS AND COMPOSITIONS THEREOF, AND INTERMEDIATES THEREFOR

Hans U. Immer, Mount Royal; Verner R. Nelson, Kirkland, and Manfred K. Gotz, Hudson, all of Canada, assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. Nos. 243,465, April 12, 1972, abandoned, and Ser. No. 226,508, Feb. 15, 1972, Pat. No. 3,835,108. This application Mar. 14, 1974, Ser. No. 451,328

Int. Cl.² A61K *29/00*, *37/00*

U.S. Cl. 424—9 **2 Claims**

1. A diagnostic method for distinguishing between hypothalmic and pituitary malfunctions or lesions in humans which comprises administering systemically to a human suspected of such malfunction from about 1 to 100 micrograms per kilogram of body weight of 5-Oxo-L-prolyl-L-histidyl-L-tryptophyl-L-seryl-L-tyrosylglycyl-L-leucyl-L-arginyl-L-prolylglycinamide or a pharmaceutically acceptable salt thereof, and detecting the rise in the level of serum leutenizing hormone.

3,947,570

ORAL PRODUCT

Philip Pensak, New Brunswick, and Joseph P. Januszewski, Somerville, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 304,040, Nov. 6, 1972, Pat. No. 3,864,472. This application Nov. 22, 1974, Ser. No. 526,446

Int. Cl.² A61K *7/22*, *7/26*

U.S. Cl. 424—54 **18 Claims**

1. A stable, visually clear, haze free, lemon oil-containing flavored mouthwash free from unpleasant tasting lemon oil natural degradation components comprising from about 60 to about 95 percent by weight of water, about 0.01 to about 1.0 percent by weight of lemon oil, about 0.1 to about 5.0 percent by weight of a nonionic surfactant chosen from the group consisting of polyoxyethylene derivatives of sorbitan mono-, di- and tri-fatty acid esters wherein the fatty acid component has between 12 and 24 carbon atoms and the polyoxyethylene chains contain about 4 to about 30 ethylene oxide units and at least 40 percent by the molecular weight of the molecule is ethylene oxide, from 0 to about 25 percent by weight of a non-toxic alcohol, about 8 to 15 percent by weight humectant and a sufficient amount of a buffering agent to maintain a pH for said mouthwash of about 3.5 to about 7.0.

3,947,571

LIPSTICK CONTAINING MICROENCAPSULATED OILS

John H. Murphy, Toms River, and George Lieberman, Ocean, both of N.J., assignors to Lanvin-Charles of the Ritz, Inc., New York, N.Y.

Filed May 6, 1974, Ser. No. 466,946

Int. Cl.² A61K *7/025*

U.S. Cl. 424—64 **11 Claims**

1. A lipstick formulation comprising oils microencapsulated within a water-soluble shell dispersed within any anhydrous base wherein said anhydrous base comprises a mixture of waxes, oils, and coloring agents and wherein said anhydrous base is present at from about 80% to about 98% by weight of said formulation and said microcapsules are present at from about 2% to about 20% by weight of said formulation.

3,947,572

IRON-RESIN ADSORBATE

Saul Borodkin, Village of Libertyville, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed July 1, 1974, Ser. No. 484,387
Int. Cl.² A61K *31/74*; C08J *3/12*, *5/20*
U.S. Cl. 424—79 3 Claims

1. In a powder suitable for the preparation of a palatable oral dosage form for a hematinic suspension for controlled release of the iron contained therein in the form of an iron adsorbate consisting essentially of 5-12% by weight of ferrous ions adsorbed on a nuclear sulfonic cation exchange resinous copolymer of styrene and divinylbenzene containing between 1% and 16% by weight of said divinylbenzene, the improvement being that essentially all iron adsorbate particles have a diameter below 50 microns.

3,947,573

OPTHALMIC SOLUTION

Billy F. Rankin, Rockville, Md., assignor to Burton, Parsons and Company, Inc., Washington, D.C.

Division of Ser. No. 324,983, Jan. 19, 1973, Pat. No. 3,856,919, which is a division of Ser. No. 44,564, June 8, 1970, Pat. No. 3,767,788, which is a continuation-in-part of Ser. Nos. 881,336, Dec. 1, 1969, abandoned, and Ser. No. 773,947, Nov. 6, 1968, abandoned. This application Oct. 18, 1974, Ser. No. 516,089
Int. Cl.² A61K *31/79*
U.S. Cl. 424—80 13 Claims

1. An opthalmic solution consisting essentially of an aqueous solution of an ethylene oxide polymer, having a molecular weight of at least about 100,000, in an amount of from about 0.05 to 2.0 weight percent sufficient to provide a viscosity of from about 0 to 30,000 cps, from about 100 to about 5,000 weight percent, based on the ethylene oxide polymer, of a lower polyalkylene glycol, having a molecular weight from about 400 to about 6,000 and from .5 to 10 percent polyvinyl pyrrolidone based on the weight of the overall solution, said composition further including a therapeutically effective amount up to about 500 weight percent, based on the weight of the ethylene oxide polymer of an opthalmic medicament.

3,947,574

SOLID STERILIZING COMPOSITIONS

Brian George Jaggers, Romford; Keith Frederick Ufton, Ilford, and Horst Richard Wagner, Ongar, all of England, assignors to Bush Boake Allen Limited, London, England

Filed June 29, 1971, Ser. No. 158,047
Claims priority, application United Kingdom, July 1, 1970, 31864/70
Int. Cl.² A01N *9/00*, *11/00*; A61K *7/46*; C11B *9/00*
U.S. Cl. 424—127 15 Claims

1. A perfumed solid sterilizing composition comprising at least one sterilizing component selected from the group consisting of hypochlorites, chlorocyanurates, chlorinated phosphates, caustic alkalis, lime and niter cake and containing as a perfumery component at least one perfumery component selected from the group consisting of

i. a perfumery monomeric titanium and zirconium esters of the formula $M(OR)_4$; and

ii. perfumery oligomeric titanium and zirconium esters of the formula $(RO)_3M(O—M(OR)_3)_nOR$ prepared by reaction of a monomeric titanium or zirconium ester of formula $M(OR)_4$ with from 50 to 90 moles water per 100 moles monomeric ester and subsequent recovery of said oligomeric ester from the resulting reaction mixture,

wherein M is titanium or zirconium; n is an integer and R is the residue of a perfumery alcohol or phenol ROH, said perfumery alcohol or phenol is selected from the group consisting of linalol; β-phenyl ethyl alcohol; benzyl alcohol; menthol; n-hexanol, α-terpineol; eugenol; cis-hex-3-en-1-ol; n-nonanol; citronellol; n-decanol; geraniol; nerol; mercenol; dihydrocitronellol; dihydrolinalol; dihydrogeraniol; isoborneol; 2,6-dimethyloctan-8-ol; farnesol; dihydrofarnesol; nerolidol; α-phenyl-n-propyl alcohol; γ-phenyl-n-butyl alcohol; γ-phenyl-n-amyl alcohol; cinnamyl alcohol; phenylethylene glycol; anisyl alcohol; dimethyl-benzyl carbinol; phenylethyldimethyl carbinol; methylphenyl carbinol; dimethylphenylcarbinol; trichloromethyl phenylcarbinol; ethylbenzylcarbinol; methylbenzylcarbinol; isopropylbenzyl carbinol; ethyl-n-amylcarbinol; methyl-n-amyl-carbinol; ω-hydroxymethyllongifolene; 6-and 10-hydroxymethyl-1,8-p-methadiene; 8-camphene carbinol; 2-hydroxy-γ-pinene; verbenol; carveol; 2-hydroxy-6-p-menthene; 5-hydroxy-3-p-menthene; 3-hydroxy-2,5-dimethyl-1,4,6-octatriene; 6,8-dihydroxy1-p-menthene; 1-hydroxy-2-p-menthene; 4-hydroxy-2-p-menthene; piperitol; carvitol; 3-hydroxy-1,1,2,3-tetramethyl-4-cyclohexene; 3-hydroxy-2-methyl-6-methylene-1,7-octadiene; 1-hydroxy-2-methylene-2,7-octadiene; 3-hydroxy-2-dimethyl-1,7 octadiene; 1-hydroxy-2,6-dimethyl-2,6-octadiene; ambrettolide; exaltolide; dihydroambrettolide; vanillin; eugenol; ethylvanillin; homovanillin; isoeugenol; methyl-isoeugenol; benzyl-iso-eugenol; thymol; and p-tertbutylphenol.

3,947,575

PEPTIDES AS ARGIOTENSIN CONVERTING ENZYME INHIBITORS

Miguel A. Ondetti, Princeton, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. Nos. 837,888, June 30, 1969, abandoned, and Ser. No. 182,560, Sept. 21, 1971, Pat. No. 3,819,831. This application June 21, 1974, Ser. No. 481,615
Int. Cl.² A61K *37/00*
U.S. Cl. 424—177 5 Claims

5. A sterile injectable solution for use in inhibiting the hypertensive effect of angiotensin I, comprising the nonapeptide L-pryroglutamyl-L-tryptophyl-L-prolyl-L-arginyl-L-prolyl-L-glutaminyl-L-isoleucyl-L-prolyl-L-proline and water for injection or saline in a concentration at least sufficient to dissolve the nonapeptide.

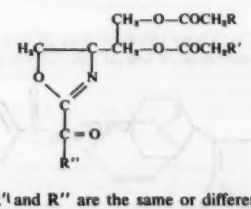
3,947,576

SYNERGISTIC BIOSTATIC COMPOSITION

John S. Kuczkowski, Chicago, and William A. Konitz, Kankakee, both of Ill., assignors to Morteil Company, Kankakee, Ill.

Filed Sept. 27, 1973, Ser. No. 401,402
Int. Cl.² A01N *9/00*, *9/22*, *9/24*, *9/28*
U.S. Cl. 424—263 4 Claims

1. A biocidal complex for contact sterilization prepared by thoroughly mixing together about 25–55% of a vinyl oxozaline fatty or carboxylic acid ester of tris-(hydroxymethyl)-aminomethane of the formula:



where R, R' and R'' are the same or different alkyl groups each of 1 to 17 carbon atoms, and about 29–69% of the biocide 2,3,5,6-Tetrachloro-4-(methylsulfonyl)-pyridine and about 6–16% of the biocide 2,4,4-Trichloro-2-Hydroxydiphenyl ether for a total of 100%.

3,947,577

ANTI-HYPERURICEMIA COMPOSITION

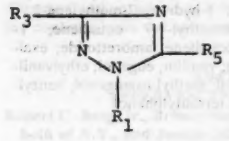
John J. Baldwin, Lansdale, and Frederick C. Novello, Berwyn, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 361,915, May 21, 1973, Pat. No. 3,892,762, which is a continuation-in-part of Ser. No. 75,784, Sept. 25, 1970, abandoned. This application Jan. 8, 1975, Ser. No. 539,488

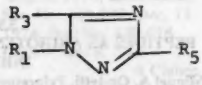
Int. Cl.² A61K *31/44*

U.S. Cl. 424—263 8 Claims

1. A composition in unit dosage form for the treatment of hyperuricemia which comprises from about 25 mg. – 1.5 g. of a compound of the formula:



or



or a non-toxic pharmacologically acceptable salt thereof, intimately dispersed in a pharmaceutically acceptable carrier, wherein R_1 is hydrogen, lower alkyl, lower alkanoyl, carbamoxy, di-lower alkylcarbamoyl or benzene sulfonyl; R_3 is phenyl, lower alkylphenyl, tri-lower alkylphenyl, pryidyl, mono-lower alkylpyridyl or di-lower alkylpyridyl; and R_5 is pyridyl, mono-lower alkylpyridyl or di-lower alkylpyridyl; including the mono N-oxides of those products wherein R_3 and R_5 are both pyridyl.

3,947,578

OMEGA-[4-(3''-INDOLYL)-PIPERIDINO]-ALKYL-ARYLKETONES AS NEVROLEPTICS

Pierre Henri Deribile, Le Perreux, and Jean-Paul Lavaux, Paris, both of France, assignors to Roussel Uclaf, Paris, France

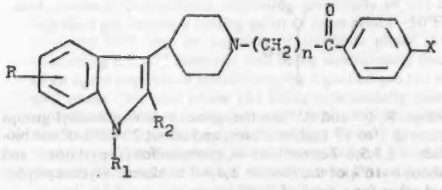
Division of Ser. No. 380,407, July 18, 1973, Pat. No. 3,850,938. This application Sept. 18, 1974, Ser. No. 506,964

Claims priority, application France, July 29, 1972, 72.27263

Int. Cl.² A61K *31/445*

U.S. Cl. 424—267 12 Claims

3. A method of depressing the central nervous system of a warm-blooded animal comprising administering to a warm-blooded animal an amount of a compound of the formula



wherein R is selected from the group consisting of hydrogen and alkoxy of 1 to 5 carbon atoms, R_1 and R_2 are individually selected from the group consisting of hydrogen and alkyl of 1 to 5 carbon atoms, *n* is 2 or 3 and X is selected from the group consisting of hydrogen, fluorine, chlorine and bromine or a non-toxic, pharmaceutically acceptable acid addition salt thereof sufficient to depress the central nervous system.

3,947,579

METHOD AND COMPOSITION FOR POTENTIATING NEUROLEPTIC DRUGS

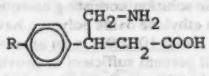
Kjell Fuxe, Sollentuna, Sweden, assignor to Nelson Research & Development Company, Irvine, Calif.

Filed June 3, 1974, Ser. No. 475,856

Int. Cl.² A61K *31/195*, *31/445*

U.S. Cl. 424—267 8 Claims

1. A method for potentiating the neuroleptic activity of butyrophenone derivatives having neuroleptic activity comprising administering to a schizophrenic about 10 to about 50 percent of a conventional dosage amount of a butyrophenone derivative having neuroleptic activity and an amount equal to about 0.1 to about 50 mg/kg of a compound, or a pharmaceutically acceptable salt thereof, having the structural formula



wherein R is selected from the group consisting of fluorine, chlorine, bromine and trifluoromethyl.

3,947,580

ANTI-ARTHRITIC COMPOSITIONS COMPRISING N-HETEROCYCLIC PULVINIC ACID AMIDES AND METHODS OF PRODUCING ANTI-ARTHRITIC ACTIVITY

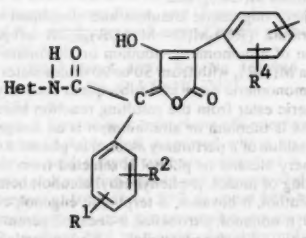
Joseph Weinstock, Phoenixville, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 393,861, Sept. 4, 1973, Pat. No. 3,895,021. This application Mar. 27, 1975, Ser. No. 562,628

Int. Cl.² A61K *31/425*

U.S. Cl. 424—270 18 Claims

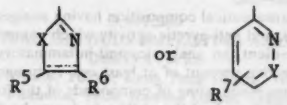
1. A pharmaceutical composition having anti-arthritic activity, in dosage unit form, comprising a pharmaceutical carrier and an effective but nontoxic amount of a compound of the formula:



in which:

R^1, R^2, R^3 and R^4 are each hydrogen, lower alkyl of from one to four carbon atoms, lower alkoxy of from one to four carbon atoms, phenyl, phenoxy, halogen, trifluoromethyl, hydroxy or, taken together in adjacent positions, methylenedioxy; and

Het is a heterocyclic moiety of the formula:



in which:

X is S, NH or O;

Y is N or CH;

R^5 and R^6 are hydrogen, methyl or halogen, or together form a 1,2-benzo radical;

R^7 is hydrogen, methyl or halogen; and

indicates an optional double bond.

3,947,581

SYNERGISTIC COMPOSITIONS CONTAINING 1,3-DICHLOROACETONE OXIME ACETATE AND SPECIFIC ISOTHIAZOLIN-3-ONE COMPOUNDS AND THEIR USE

Paul Swered, Philadelphia, and Dana U. Michael, Cornwells Heights, both of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Apr. 17, 1975, Ser. No. 568,957

Int. Cl.² A01N *9/12, 9/02*

U.S. Cl. 424—270 **8 Claims**

1. A composition for the control of the microorganism *Aerobacter aerogenes* in aqueous systems comprising a mixture of 1,3-dichloroacetone oxime acetate, with a mixture of 75% of 5-chloro-2-methyl-4-isothiazolin-3-one calcium chloride and 25% of 2-methyl-4-isothiazolin-3-one calcium chloride wherein the weight ratio of the acetate to the chloride mixture ranges from about 95:5 to about 5:95 respectively.

3,947,582

PHENYLACETIC ACID COMPOUNDS IN TREATING ABNORMAL PLATELET AGGREGATION

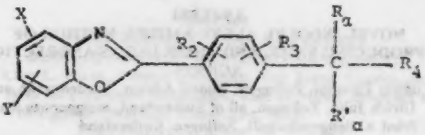
Tsung-Ying Shen, Westfield, N.J.; Jorge P. Li, Brown Deer, Wis., and Conrad P. Dorn, Jr., Plainfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 388,852, Aug. 16, 1973, Pat. No. 3,899,506, which is a continuation-in-part of Ser. No. 165,389, July 22, 1971, abandoned, which is a continuation-in-part of Ser. No. 71,227, Sept. 10, 1970, abandoned. This application Feb. 10, 1975, Ser. No. 548,486

Int. Cl.² A61K *31/42*

U.S. Cl. 424—272 **24 Claims**

1. A method for treating a condition exhibiting abnormal platelet aggregation which comprises the administration to humans and animals of a therapeutically effective amount of a compound having the formula:



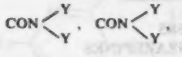
or a pharmaceutically acceptable salt thereof, wherein

R is hydrogen or methyl;

R′ is hydrogen, or R and R′ taken together can be methylene: of R′ can be a methylene linkage attached to the unsubstituted ortho position of the benzenoid ring;

X, Y, R_2 and R_3 are the same or different and each is hydrogen, C_{1-3}alkyl, chloro, bromo, fluoro; and

R_4 is COOH; COOR, wherein R may be C_{1-3}alkyl, $CONH_2$,



where Y may be C_{1-3}alkyl.

3,947,583

METHOD FOR CONTROLLING FUNGI UTILIZING PYRAZOLINIUM COMPOUNDS

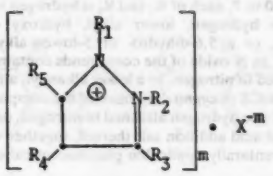
Herman Berenson, Trenton, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Jan. 13, 1975, Ser. No. 540,736

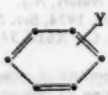
Int. Cl.² A01N *9/22*

U.S. Cl. 424—273 **9 Claims**

1. A method for the control of plant pathogenic fungi comprising: contacting said fungi with a fungicidally effective amount of a compound having the formula:



wherein R_1 and R_2 each represent alkyl C_1–C_4; R_4 represents hydrogen or methyl and; R_3 and R_5 each represent



X represents an anion having a charge of from 1 to 3; *m* is an integer from 1 to 3 and Y represents a member selected from the group consisting of hydrogen, halogen, alkyl C_1–C_4 and alkoxy C_1–C_4.

3,947,584

NOVEL INDOLYL ALKYL AMINES, METHOD OF PRODUCING SAME, AND THEIR USE AS ANORECTIC AGENTS

Ludwig Zirngibl, Zofingen; Rudolf Adrian, Vordemwald, and Ulrich Jahn, Zofingen, all of Switzerland, assignors to Siegfried Aktiengesellschaft, Zofingen, Switzerland

Filed Sept. 17, 1973, Ser. No. 397,779

Claims priority, application Switzerland, Sept. 15, 1972, 13517/72

Int. Cl.² A61K *31/40*

U.S. Cl. 424—274 1 Claim

1. A method of inhibiting or reducing appetite in a mammal or a human comprising administering to said mammal or human in need of such treatment an effective amount of a compound selected from the class consisting of 3-(2'-amino-2'-methylbutyl)-indole and its pharmaceutically acceptable nontoxic acid addition salts.

3,947,585

PYRAZOLOBENZAZEPINES

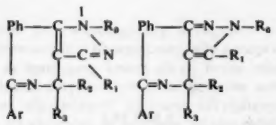
Heinz Werner Gschwend, New Providence, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed June 3, 1974, Ser. No. 475,474

Int. Cl.² A61K *31/415*, *31/54*, *31/535*, *31/445*

U.S. Cl. 424—273 3 Claims

1. An antianxiety and antidepressant pharmaceutical composition comprising an anxiolytic or antidepressively effective amount of a compound of the formulae



wherein Ar is unsubstituted phenyl or phenyl substituted by one or two, of the same or different substitutents selected from the group consisting of lower alkyl, lower alkoxy, halo or trifluoromethyl, Ph is 1,2-phenylene substituted by one or two halogen atoms, R_o is hydrogen, lower alkyl, (hydroxy, lower alkoxy or Am)-C_mH_{2m} or AR-C_nH_{2n}, wherein Am is amino, mono- or di-lower alkylamino, lower alkyleneimino or monoaza-, oxa- or thia-alkyleneimino, wherein the additional nitrogen, oxygen or sulfur atom is separated from the imino-nitrogen by at least 2 carbon atoms, *m* is an integer from 1 to 7, *n* such from 0 to 7, each of R_1 and R_2 is hydrogen or lower alkyl, and R_3 is hydrogen, lower alkyl, hydroxy or lower alkanoyloxy, or a 5,6-dihydro- or 5-lower alkyl-5,6-dihydro derivative, an N-oxide of the compounds containing no hydrogen attached to nitrogen, or a lower alkanoyl, alkoxycarbonyl, AmCO, AmCS or cyano derivative of the compounds containing at least one hydrogen attached to nitrogen, or a therapeutically useful acid addition salt thereof, together with an enterally or parenterally applicable pharmaceutical excipient.

3,947,586

METHOD OF COMBATTING SWINE DYSENTERY

Robert Earl Messersmith, Trenton, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed May 20, 1974, Ser. No. 471,372

Int. Cl.² A61K *31/35*

U.S. Cl. 424—283 2 Claims

1. A method for the control of swine dysentery which comprises orally administering ad libitum to swine infected with swine dysentery sufficient amount of a ration containing from about 0.0055% by weight to about 0.055% by weight of, as the active compound, antibiotic X537A or equivalent amount of a pharmaceutically acceptable salt thereof to provide about 1.6 to 3.7 mg. per pound of animal per day of said antibiotic.

3,947,587

ANALGESICS OBTAINED BY REACTING A PRIMARY AMINE AND AN ALDEHYDE

Georges Negrevergne, Bordeaux, France, assignor to Societe Anonyme Cortial S. A., Paris, France

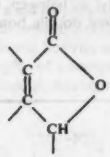
Filed Jan. 26, 1973, Ser. No. 327,236

Claims priority, application France, Jan. 27, 1972, 72.02644

Int. Cl.² A61K *31/34*

U.S. Cl. 424—285 4 Claims

1. A pharmaceutical composition having analgesic, anti-inflammatory, and anti-pyretic activity which comprises, as the active ingredient, an analgesic, anti-inflammatory and anti-pyretic effective amount of at least one compound selected from the group consisting of compounds of the formula R—Z—R', in which each of R and R', which may be the same or different, represents a phenyl radical which is optionally substituted by at least one substituent selected from a halogen atom, $—OC_2H_5$, $—OCH_3$, $—CH_3$, $—COOC_2H_5$, $—COOCH_3$, and —COOH radical; and Z represents CH—NH— in which the radical CH— of said amino group forms part of a heterocyclic structure of the formula



in which the two carbon atoms, connected by a double bond, form part of the radical R or R' in association with a pharmaceutically acceptable carrier material.

3,947,588

CYCLOPROPANE CARBOXYLIC ACID DERIVATIVES FOR LOWERING THE LEVEL OF KETONE BODIES

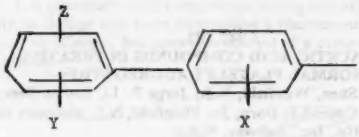
Margaret H. Sherlock, Bloomfield, and Nathan Sperber, North Caldwell, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

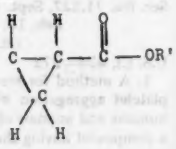
Division of Ser. No. 177,871, Sept. 3, 1971, Pat. No. 3,857,880. This application Oct. 21, 1974, Ser. No. 516,327

Int. Cl.² A61K *31/19*

U.S. Cl. 424—317 5 Claims

1. A method for lowering the level of ketone bodies in the bloodstream in a ketotic mammal comprising administering to said mammal a therapeutically effective amount for lowering the level of ketone bodies in the bloodstream in said mammal of a composition of the formula





wherein X, Y and Z are independently hydrogen, halogen, trifluoromethyl, hydroxy, nitro, lower alkyl or lower alkylthio; and R′ is hydrogen, an alkyl having 1 to 12 carbon atoms or a pharmaceutically acceptable cation.

3,947,589
FUNGICIDAL METHODS EMPLOYING AMINO ACID DERIVATIVES

Tomomasa Misato, Tokyo; Keng Tang Huang, Wako; Yasuo Homma, Fukuoka; Seizo Kanao, Tokyo; Takeshi Toyoda, Sagamihara; Tadashi Suyama, and Toshiro Shida, both of Kawasaki, all of Japan, assignors to Rikagaku Kenkyusho, Saitama and Ajinomoto Co. Ltd., Tokyo, both of, Japan

Continuation of Ser. No. 219,554, Jan. 20, 1972, abandoned. This application May 9, 1974, Ser. No. 468,266

Claims priority, application Japan, Jan. 23, 1971, 46-1833; June 26, 1971, 46-46024

Int. Cl.² A01N 9/20

U.S. Cl. 424—319 **7 Claims**

1. A method of protecting plants from attack by plant disease fungi or bacteria which comprises applying onto a fungus-susceptible plant a fungicidal amount of a compound selected from the group consisting of an N-acyl derivative of a neutral amino acid wherein said acyl moiety is selected from the group consisting of decanoic acid, lauric acid, palmitic acid, stearic acid, oleic acid, linolenic acid, coconut oil fatty acid, myristic acid, capric acid and undecylenic acid and said neutral amino acid is selected from the group consisting of glycine, phenylglycine, alanine, α-aminobutyric acid, valine, norvaline, leucine, isoleucine, norleucine, phenylalanine, p-nitrophenylalanine, tryptophane, proline, methionine, threonine and sarcosine or the lithium, sodium, potassium or ammonium salts of said N-acyl derivative of a neutral amino acid.

3,947,590
COMPOSITIONS AND METHODS OF INCREASING RENAL BLOOD FLOW WITH GAMMA-GLUTAMYL AMIDE OF DOPAMINE

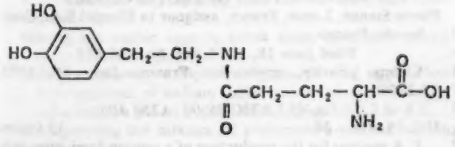
Jaroslav Kyncl, Lake Bluff; Kathleen Riley Lynn, Gurnee; Yvonne Connolly Martin, Waukegan, and Carroll Wayne Ours, Zion, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 408,902, Oct. 23, 1973, Pat. No. 3,903,147. This application Jan. 27, 1975, Ser. No. 544,101

Int. Cl.² A61K 31/20, 31/185, 31/615, 31/52

U.S. Cl. 424—319 **4 Claims**

1. A method of increasing renal blood flow of warm-blooded mammals which comprises administering to said mammals at least an effective amount of a renal vasodilator compound comprising a γ-glutamyl amide of dopamine selected from the group consisting of



and a pharmaceutically acceptable acid addition salt thereof.

3,947,591
PESTICIDAL N,N″-THIO AND DITHIO BIS(SUBSTITUTED PHENYL FORMAMIDINES)

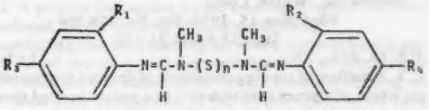
Victor L. Rizzo, Almena Township, Van Buren County, and Alan R. Friedman, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed May 7, 1975, Ser. No. 575,248

Int. Cl.² C07C 123/00, 145/02

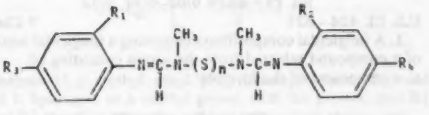
U.S. Cl. 424—326 **25 Claims**

1. A compound of the formula:



wherein R_1 and R_2 are the same or different and are selected from the group consisting of lower alkyl of from 1 to 4 carbon atoms; R_3 and R_4 are the same or different and are selected from the group consisting of hydrogen, halogen, and lower alkyl of from 1 to 4 carbon atoms, and n is 1 or 2 provided that when n is 2 then R_1 and R_2 are the same and R_3 and R_4 are the same.

18. A process for controlling insect pest populations which comprise applying to a situs effective amounts of a compound of the formula:



wherein R_1 and R_2 are the same or different and are selected from the group consisting of lower alkyl of from 1 to 4 carbon atoms; R_3 and R_4 are the same or different and are selected from the group consisting of hydrogen, halogen, and lower alkyl of from 1 to 4 carbon atoms, and n is 1 or 2 provided that when n is 2 then R_1 and R_2 are the same and R_3 and R_4 are the same.

3,947,592

TREATMENT OF OPIATE ADDICTION

Hanus J. Grosz, Indianapolis, Ind., assignor to Indiana University Foundation, Bloomington, Ind.

Filed May 22, 1972, Ser. No. 255,587
Int. Cl.² A61K *31/135*
U.S. Cl. 424—330 **10 Claims**

1. A method of blocking the euphoric rewarding effects experienced by one addicted to an opiate drug comprising administering to the addict propranolol in a dosage of at least 5 milligrams per day.

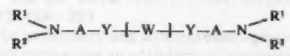
3,947,593

PHARMACEUTICALLY USEFUL BIS-AMINE DERIVATIVES

Irving Shemano, Cincinnati, Ohio, assignor to Richardson-Merrell Inc., Wilton, Conn.

Filed June 15, 1973, Ser. No. 370,290
Int. Cl.² A61K *31/135*
U.S. Cl. 424—330 **13 Claims**

1. A method of treating conditions of delayed hypersensitivity which comprises administering to a patient in need thereof a compound selected from the formula



wherein [W] is an aromatic polycyclic nucleus selected from fluoranthene, fluorene, fluoren-9-ol, fluoren-9-one, or anthraquinone; Y is selected from carbonyl, divalent sulfur, or oxygen with the proviso that when Y is carbonyl, [W] is other than fluoren-9-ol or anthraquinone; A is selected from a straight or branched alkylene chain of from 1 to 6 carbon atoms; and each of R^1 and R^2 is selected from hydrogen, straight or branched lower alkyl of from 1 to 4 carbon atoms, or alkenyl of 3 to 6 carbon atoms, having the vinyl unsaturation in other than the 1-position; and pharmaceutically acceptable acid addition salts thereof, in an amount effective to suppress delayed hypersensitivity.

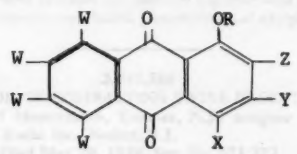
3,947,594

4-HALO-1-HYDROXYANTHRAQUINONE CONTAINING FUNGICIDAL COMPOSITION

David I. Randall, Easton, Pa., assignor to GAF Corporation, New York, N.Y.

Continuation of Ser. No. 358,081, May 7, 1973, abandoned. This application Dec. 18, 1974, Ser. No. 534,147
Int. Cl.² A01N *9/00, 9/14, 9/24*
U.S. Cl. 424—331 **7 Claims**

1. A fungicidal composition comprising a fungicidal amount of a compound selected from the group consisting of
a. a compound of the formula:



wherein R is a member selected from the group consisting of hydrogen and acyl having 2 to 4 carbon atoms; X is a member selected from the group consisting of chloro, fluoro and bromo; Z is a member selected from the group consisting of hydrogen, chloro, fluoro, bromo, nitro, sodium sulfo and lower alkyl; Y is a member selected from the group consisting of hydrogen, halo and lower alkyl; and W is a member selected from the group consisting of hydrogen, hydroxy, halo and lower alkyl; and

b. a metal salt thereof selected from the group consisting of zinc, calcium, ferric, manganese, sodium, potassium and copper in admixture with a suitable carrier therefor.

3,947,595

2.2 DICHLORO -1,1,-DIFLUOROETHYL-1,2,2,2-TETROFLUOROETHYL ETHER AS AN INHALATION ANESTHETIC

Ross C. Terrell, Plainfield, N.J., assignor to Airco, Inc., Montvale, N.J.

Division of Ser. No. 170,954, Aug. 11, 1971, Pat. No. 3,764,706. This application June 6, 1973, Ser. No. 367,596
Int. Cl. A61k *27/00*
U.S. Cl. 424—342 **2 Claims**

1. An inhalant anesthetic composition comprising $CF_3CHF—O—CF_2—CHCl_2$ and oxygen in suitable proportions for use as an anesthetic.

3,947,596

FREE-FLOWING, HIGH DENSITY, AGGLOMERATED VITAMIN A POWDER COMPOSITIONS

Marco Alfred Cannalonga, Fort Lee, and Louis Vincent Czarecki, Succasunna, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 242,789, April 10, 1972, abandoned. This application June 26, 1974, Ser. No. 483,341
Int. Cl.² A61K *31/07*
U.S. Cl. 424—344 **1 Claim**

1. A spray-dried, free-flowing, Vitamin A powder composition suitable for use in direct compression tableting techniques which comprises, in percents by weight based on the total weight of the powder composition, from about 15% to about 30% of vitamin A palmitate, from about 50% to about 65% of a hydrolyzed gelatin of low Bloom, from about 10% to about 20% sucrose, from about 2% to about 6% of 1,2-dihydroxy-6-ethoxy-2,2,4-trimethylquinoline and from about 1% to about 5% of silicic acid; said composition in the form of agglomerated particles having a bulk density range of from about 35 pounds to about 45 pounds per cubic foot.

3,947,597

METHOD OF MAKING A UNIFORM DOUGH MIXTURE CONTAINING SCRAP DOUGH

Clarence A. Kieffaber, Overland Park, Kans., assignor to Marion Corporation, Kansas City, Kans.

Filed Oct. 10, 1974, Ser. No. 513,652
Int. Cl.² A21D *8/00*
U.S. Cl. 426—27 **4 Claims**

1. The method of continuously making a uniform dough mixture, containing scrap sheeted leavened dough in a continuous dough mixer comprising continously mixing into a new dough the dough ingredients required for said new dough and feeding a continuous length of connected areas of said scrap dough in a substantially uniform stream into the mass of mixing new dough ingredients in said mixer prior to completion of development of said new dough, and continuing the mixing of said scrap dough with said new dough ingredients to the full development of said new dough.

3,947,598

MANUFACTURE OF PROTEIN FOODS

Pierre Stenne, Lozon, France, assignor to Claudel S.A., Courbevoie, France

Filed June 18, 1974, Ser. No. 480,575
Claims priority, application France, June 18, 1973, 73.22086
Int. Cl.² A23C *19/00*; A23J *3/00*
U.S. Cl. 426—36 **13 Claims**

1. A process for the production of a protein food, especially cheese, which comprises coagulating the coagulable proteins of a vegetable or an animal milk to provide a curd, treating the

curd obtained by ultrafiltration on at least one semi-permeable membrane and collecting a concentrated curd of which the dry solids content and the ratio by weight of proteins to non-proteins are substantially equal to those of the protein food.

3,947,599

PROCESS FOR MAKING FLAVORLESS FOOD EXTENDERS DERIVED FROM PEANUTS, AND A METHOD OF RECOVERING PEANUT OIL

Jack H. Mitchell, Jr., 101 Bradley St., Clemson, S.C. 29631

Filed Jan. 30, 1975, Ser. No. 545,446
Int. Cl.² A23L *1/20*; A23D *5/02*
U.S. Cl. 426—250 8 Claims

1. A process for producing flavorless thermostable fat-free peanut flakes having utility as a high protein food extender comprising the steps of:

coarsely grinding blanched unroasted peanuts so as to release only a minimum amount of peanut oil;

mixing one part of the coarsely ground peanuts with one to two parts of water by weight;

disintegrating the solids and homogenizing the mixture to form a suspension of finely divided peanut particles and emulsified oil;

drying the emulsion-suspension on a drum dryer to form flakes; and

extracting oil from the flakes with a solvent and evaporating residual solvent from the flakes to obtain fatfree high protein flakes.

3,947,600

DIPEPTIDE SWEETENING OF COMESTIBLES

Patrick M. Rousseau, Lansing, Mich., assignor to General Foods Corporation, White Plains, N.Y.

Filed Oct. 12, 1973, Ser. No. 405,985
Int. Cl.² A23L *1/18*, *1/164*
U.S. Cl. 426—302 8 Claims

1. Process for sweetening a dry alimentary comestible coated with a lower alkyl ester of L-aspartyl L-phenylalanine dipeptide sweetening compound which comprises forming a relatively saturated aqueous solution of the dipeptide and water, converting the solution into a foam, applying the foam as a surface coating onto the comestible.

3,947,601

FOOD FOR SEA LIFE COMPRISING HOMOGENIZED MIXTURE OF SEA URCHIN EGGS AND SODIUM SULFITE PRESERVATIVE

Michael Ortega, 20031 SW. Birch, Santa Ana, Calif. 92701

Filed July 18, 1974, Ser. No. 489,582
Int. Cl.² A23K *1/18*
U.S. Cl. 426—330.1 6 Claims

1. The method of preparing food for sea life which comprises the steps of:

beating sea urchin eggs to break them open and reduce them to a homogeneous mass;

adding a quantity sufficient to preserve said eggs, when homogenized, of sodium sulfite preservative to the eggs;

adjusting the pH to a value in the range of 5.3 to 6.5;

homogenizing the mixture of preservative and sea urchin eggs; and

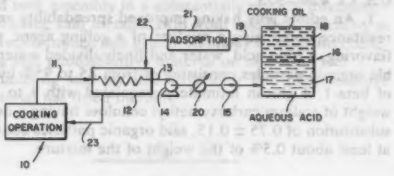
pasturizing the mixture.

3,947,602

TREATMENT OF COOKING OIL

Willard S. Clewell, Jr., and Bernard Friedman, both of Allentown, Pa., assignors to Bernard Friedman, Allentown, Pa.

Filed Apr. 29, 1974, Ser. No. 464,940
Int. Cl.² A23D *5/04*; C11B *3/04*
U.S. Cl. 426—417 7 Claims



1. A process for treating a used cooking oil which has been employed for the cooking of food, comprising:

contacting the used cooking oil with a solution having dissolved therein a food compatible acid in an amount and concentration sufficient to extract from the cooking oil food juice components in the oil derived from the food being cooked; and

separating the acid solution from the cooking oil prior to reuse of said cooking oil to thereby increase the life of the cooking oil.

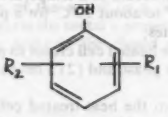
3,947,603

FLAVORING AGENT

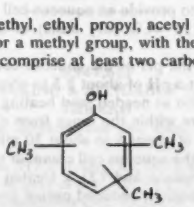
Max Winter, Geneva; Fritz Gautschi, Vaud; Ivon Flament; Max Stoll, both of Geneva, all of Switzerland, and Irving M. Goldman, Niantic, Conn., assignors to Firmenich & Cie, Geneva, Switzerland

Division of Ser. No. 243,866, April 13, 1972, abandoned, which is a division of Ser. No. 70,560, Sept. 8, 1970, Pat. No. 3,702,253, which is a continuation of Ser. No. 543,069, April 18, 1966, abandoned, which is a continuation-in-part of Ser. No. 452,342, April 30, 1965, abandoned. This application June 24, 1974, Ser. No. 482,686
Int. Cl.² A23L *1/234*
U.S. Cl. 426—538 96 Claims

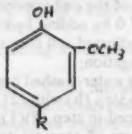
1. As a new composition of matter a soluble coffee material having added thereto a minor, but flavor-modifying amount of a compound selected from the group of compounds having the general formulae:



wherein R1 is methyl, ethyl, propyl, acetyl or propionyl and R2 is hydrogen or a methyl group, with the proviso that R1 and R2 together comprise at least two carbon atoms; and



and



wherein R is ethyl or propyl.

3,947,604

EDIBLE JELLY AND METHOD OF PREPARING SAME

Emanual J. McGinley, New Castle, Del., and Francis H. Tolan, Furlong, Pa., assignors to FMC Corporation, Philadelphia, Pa.

Filed Mar. 28, 1975, Ser. No. 563,242
Int. Cl.² A23L *1/06*
U.S. Cl. 426—573 9 Claims

1. An edible jelly having improved spreadability and heat-resistance comprising a mixture of a gelling agent, sucrose, flavoring, a food acid, water and finely-divided water-insoluble organic particles consisting of from 85 to 95% by weight of beta-1, 4 glucan intimately associated with 5 to 15% by weight of sodium carboxymethyl cellulose having a degree of substitution of 0.75 ± 0.15, said organic particles constituting at least about 0.5% of the weight of the mixture.

3,947,605

PROCESS FOR PREPARING HIGH YIELDS OF SINGLE CELL PRODUCTS HAVING REDUCED PURINE CONTENT AND HIGH NUTRITIVE VALUE

Kwei C. Chao, Naperville, Ill., assignor to Standard Oil Company, Chicago, Ill.

Filed Oct. 30, 1974, Ser. No. 519,265
Int. Cl.² A23J *1/00*
U.S. Cl. 426—656 18 Claims

1. A process for substantially reducing the purine content while increasing the yield and nutritive value of single-cell protein material, intended for use in food products and derived from unicellular microorganisms grown in a fermentor aerobically in a suitable fermentation broth, comprising the steps of:

a. preparing an aqueous cell cream containing from 10 to 14 wt.% (dry basis) of single-cell protein material;
b. heating the cell cream to a temperature within the range from about 70° to about 90°C. for a period of about 5 to about 10 minutes;
c. centrifuging the heated cell cream to provide (1) a supernatant aqueous phase and (2) a heat-treated cell concentrate;
d. adding water to the heat-treated cell concentrate from step (c) (2) to provide an aqueous cell cream containing from 10 to 14 wt.% (dry basis) of single-cell protein material;
e. maintaining the pH of the aqueous cell cream provided in step (d) at a pH of about 8.5 to about 10.0 by adding a base solution as needed, and heating the cell cream to a temperature within the range from about 85° to 95°C. for a period of about 5 to about 30 minutes;
f. centrifuging the aqueous cell cream of step (e) to provide (1) a supernatant and (2) a treated cell concentrate, having substantially reduced purine content;
g. adjusting the pH of the cell concentrate provided in step (f)(2) to about 7.0 by adding hydrochloric acid;
h. washing the pH adjusted cell concentrate of step (g) with water by centrifugation;
i. combining (1) the water-washed heat-treated cell concentrate produced in step (h) with (2) the supernatant aqueous phase produced in step (c)(1); and
j. drying the mixture of step (i) to give a reconstituted product.

3,947,606

PROCESS FOR PRODUCING CHEMICAL COMPOUNDS APPLICABLE TO SURFACES IN THE FORM OF THIN LAYERS

Franz Rohr, Ober-Abtsteinach; Heinz Holtschmit, Mannheim, and Gerhard Siewerth, Speyer, all of Germany, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Sept. 4, 1974, Ser. No. 503,186
Claims priority, application Germany, Sept. 8, 1973, 2345441
Int. Cl.² C23C *13/00*
U.S. Cl. 427—50 9 Claims

1. Process of forming and applying a layer of a reaction product to a surface of a base, which comprises:

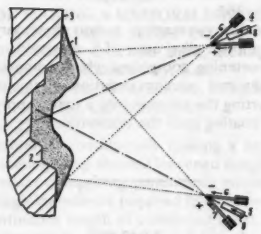
bringing together at least two chemically different components, one of which is an electric conductor, and the other is a solid or liquid in imediate contact therewith, in immediate proximity to said base, and
explosively forming a reaction product of said components by effecting a surge current discharge through said conductor, thereby generating a plasma state in which said formed reaction product is hurled against the surface of said base.

3,947,607

METHOD FOR REINFORCING PISTONS

Simon Thomas Gazzard, New Milton, and Harold Taylor Hill, Lymington, both of England, assignors to Wellworthy Limited, New Milton, England

Filed May 13, 1974, Ser. No. 469,465
Claims priority, application United Kingdom, May 25, 1973, 25318/73; Oct. 12, 1973, 47845/73
Int. Cl.² B05D *1/08*
U.S. Cl. 427—37 11 Claims



1. A method of forming a deposit of a reinforcing material on an aluminium alloy piston which includes the step of spraying one or more regions of the piston with a copper-based material from an electric-arc spray gun whose operating arc voltage and gas pressure are adjusted to produce molten particles of a size, velocity and heat content sufficient to produce an effective metallurgical interaction with the aluminium alloy of the piston at a temperature below the boiling point of said alloy, whereby the copper-based material is bonded to said one or more regions of the piston.

3,947,608
METHOD OF MANUFACTURING AN ELECTRICALLY CONDUCTING LAYER ON AN INTERNAL WALL PART OF A CATHODE-RAY TUBE

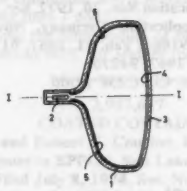
Hans Dignus Duinker, and Jan Francis Cornelis Maria Wijnen, both of Eindhoven, Netherlands, assignors to U. S. Philips Corporation, New York, N.Y.

Filed Nov. 1, 1974, Ser. No. 520,032

Claims priority, application Netherlands, Nov. 26, 1973, 7216104

Int. Cl.² B05D *5/06, 5/12*

U.S. Cl. 427—64 **6 Claims**



1. A method of manufacturing an electrically conducting layer on an internal wall part of a cathode-ray tube comprising the steps of: (1) manufacturing a suspension comprising at least an electrically conducting material and a binder as well as an addition consisting of one or a mixture of more than one inorganic salt selected from the group of alkali and ammonium sulphates and alkali and ammonium nitrates, to infuence the adhesion, the hardness and the resistance against shrinkage and wear of said material; (2) providing a layer of the said suspension on the wall part; and (3) drying the layer of the said suspension and firing the cathode-ray tube.

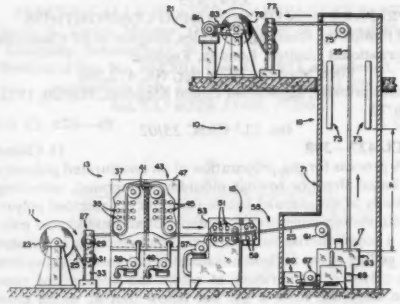
3,947,609
METHOD FOR COATING METALLIC STRIPS

Leadom A. Warner, Sayre, and Kenneth Shaner, Luthers Mills, both of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Division of Ser. No. 289,180, Sept. 14, 1972, Pat. No. 3,875,900. This application Sept. 18, 1974, Ser. No. 507,203

Int. Cl.² H01J *29/00*

U.S. Cl. 427—68 **3 Claims**



1. A method for simultaneously applying a relatively thin coating of photosensitive material sensitized by a dichromate ion to both sides of a substantially horizontally aligned metallic strip for utilization in aperture masks for color television cathode ray tubes and for drying said material thereon, said method comprising:

continuously supplying a moving substantially horizontally aligned metallic strip along a predetermined path;

applying a relatively thin coating of photosensitive material to both sides of said metallic strip by substantially submerging said strip within a tank assembly having said photosensitive material therein;

overflowing said tank assembly to continuously agitate the surface of said photosensitive material in the area immediately surrounding said metallic strip as said strip exits said tank assembly in a substantially vertical direction;

withdrawing said metallic strip from said tank assembly at a predetermined rate in a substantially vertical direction;

drying said photosensitive material on said strip; and

accumulating said metallic strip after said photosensitive material has dried thereon.

3,947,610
PROCEDURE FOR SEALING LEAKS IN CLOSED COOLING SYSTEMS

Maurice Bodmer, Nussbaumen; Edmund Hartinger, Rutihof-Baden, and Albert Huber, Moriken, all of Switzerland, assignors to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Continuation-in-part of Ser. No. 293,641, Sept. 26, 1972, Pat. No. 3,850,657. This application Aug. 7, 1974, Ser. No. 495,511

The portion of the term of this patent subsequent to Nov. 26, 1991, has been disclaimed.

Int. Cl.² C09K *3/12;* **B32B** *15/00*

U.S. Cl. 427—142 **13 Claims**

1. A method for sealing leaks in a closed cooling system which contains an aqueous medium as the coolant, which comprises:

introducing into the coolant a water-soluble, reducible metal hydroxide, inorganic salt, organic salt, or a complex thereof, of a metal selected from the group consisting of Cu, Bi, Cr, Fe, Mn, Mg, Zn, Al, Sb, Ca, Ba, Sr, Hg, Ag, Au, Sn, Ni, Cd, Pb, Co, Pt, Rh, Ir, and Pd, or a water-soluble, reducible metal oxide of a metal selected from the group consisting of:

Bi, Cr, Fe, Mn, Mg, Zn, Al, Sb, Ca, Ba, Sr, and Hg, wherein the concentration of said soluble metal cation ranges from 10^{-8} to 1 molar; and

introducing a reducing agent into said coolant in a concentration between 10^{-6} and 1 molar, so as to cause electroless deposition of the metal or a corresponding metal compound wherein the metal is present in a lower valence state, whereby leaks in the closed cooling system are sealed.

3,947,611
METHOD OF MAKING A BONDABLE LOW FRICTION THREAD

Charles S. White, 35815 42nd St., East, Palmdale, Calif. 93550

Division of Ser. No. 317,111, Dec. 21, 1972, abandoned, which is a continuation-in-part of Ser. No. 76,110, Sept. 28, 1970, abandoned. This application Oct. 29, 1974, Ser. No. 518,567

Int. Cl.² B65H *49/00, 54/02*

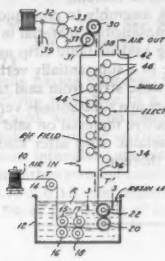
U.S. Cl. 427—177 **10 Claims**

1. The method of making a bondable low friction thread, comprising:

treating lengths of low friction thread to render the thread bondable by providing a thread comprised of low friction filaments intertwined with lengths of bondable filaments,

passing the thread lengthwise through a bath of bonding resin to apply the same thereto,

leading the thread lengthwise vertically out of the bath and while supporting it in a vertical position curing the resin



on the thread to the B-stage, and
winding the B-staged thread into spools for subsequent use.

3,947,612

METHOD OF FORMING ACTIVE SURFACES ON SOLIDS

Reinhold Schulze, Meckelfeld, Germany, assignor to Norddeutsche Affinerie, Hamburg, Germany

Filed Apr. 17, 1973, Ser. No. 352,082

Claims priority, application Germany, Apr. 19, 1972, 2218900

Int. Cl.² B23B 7/04

U.S. Cl. 427—222 **1 Claim**

1. A process for bonding a particulate active solid consisting of calcium stannate to pieces of polystyrene substrate, which comprises:

depositing said calcium stannate on the polystyrene from an aqueous medium containing essentially:

a. at least one water-insoluble synthetic resin selected from the group which consists of copolymers of acrylic esters with styrene, vinyl ethers, vinyl esters, vinyl chloride, and vinylidene chloride, and

b. at least one further synthetic resin, water-soluble or water-swellable substance serving as a flocculating agent for said calcium stannate, said flocculating agent being a polyacrylamide or a polyethylene imine, the ratio of said synthetic resin (a) to said flocculating agent (b) is water-soluble or within the range **10:1** to **1:10** where said flocculating agent is water-swellable.

3,947,613

PROCESS FOR REDUCING AGENT MIGRATION DURING TREATMENT OF KNITTED COTTON FABRIC

Bethlehem K. Andrews; John G. Frick, Jr., both of New Orleans, and Wilson A. Reeves, Metairie, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 7, 1974, Ser. No. 495,461

Int. Cl.² B05D 3/12, 3/02

U.S. Cl. 427—242 **5 Claims**

1. A process for imparting to tubular knitted cotton textiles the enhancing qualities of durable press and dimensional stability by means of a chemical finish that is uniform throughout the fibers of the fabric and results in generally superior properties of the textile and in elimination of shade and color differences between fabric surfaces on subsequent dyeing, the process comprising:

a. impregnating the tubular knitted cotton to a wet pick-up of from 20 to 35% with an aqueous solution containing:

1. a methylol amide crosslinking agent,

2. an acid catalyst, and

3. a non-ionic surfactant, and

b. mechanically agitating the impregnated textile for from 10 to 15 minutes at temperatures of from 45° C. to 75° C. while preventing water evaporation from said textile;

c. drying the mechanically agitated moist textile; and

d. curing the dry textile at an elevated temperature.

3,947,614

PROTECTION FROM CORROSION OF RESISTANCE-WELDED SHEET METAL COVERED WITH NON-METALLIC LAYERS

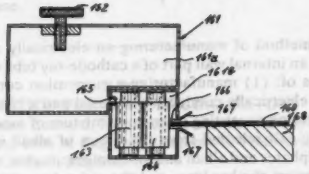
Otto Alfred Becker, 59 Robert-Koch-Strasse, 66 Saarbrucken 6, Germany

Continuation of Ser. No. 56,197, July 13, 1970, abandoned, which is a continuation of Ser. No. 681,694, Nov. 9, 1967, abandoned. This application Nov. 20, 1972, Ser. No. 307,836

Claims priority, application Germany, Nov. 11, 1966, 89773; Feb. 6, 1967, 91065; Feb. 11, 1967, 91162; July 29, 1967, 93710; Sept. 2, 1967, 94270

Int. Cl.² C23F 11/00

U.S. Cl. 427—284 **9 Claims**



1. A method for the protection from corrosion of blank areas of sheet metal otherwise coated with a corrosion-proof layer, comprising the steps of continuously wetting a porous transfer roller with a rust-protective liquid material, rotating said transfer roller in contact with a porous applicator, and rotating said porous applicator in contact with the exposed blank edge portions of said coated sheet metal, thereby applying to said blank areas a permanent layer of said rust-protective material.

3,947,615

PREPARATION OF MOULDING COMPOSITIONS

David Philip Fry, Glamorgan, Wales, assignor to BP Chemicals International Limited, London, England

Filed May 22, 1974, Ser. No. 472,366

Claims priority, application United Kingdom, May 20, 1973, 25626/73

Int. Cl.² C03C 25/02

U.S. Cl. 427—398 **11 Claims**

1. A process for the preparation of an unsaturated polyester resin based sheet or rovings moulding compound, consisting essentially of the steps of heating a liquid unsaturated polyester resin system consisting essentially of an unsaturated polyester, a copolymerisable monomer, a polymerisation initiator and a gelling agent for said unsaturated polyester resin system to an elevated temperature at which the unsaturated resin system does not form a gel but below that at which cross linking of the system occurs, said gelling agent being soluble in said mixture of unsaturated polyester and copolymerisable monomer at said elevated temperature and being capable of initiating formation of a high viscosity gel when said solution is cooled from said elevated temperature to below 30°C., impregnating a fibrous reinforcement with said liquid unsaturated polyester resin system while said resin system is at said elevated temperature, and subsequently cooling the resultant moulding compound to a temperature at which the liquid unsaturated polyester resin system forms a gel.

3,947,616
PROCESS FOR PRODUCING COBALT COATED REFRACTORY METAL CARBIDES

Joseph E. Ritsko, and Donald S. Parsons, both of Towanda, Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Sept. 27, 1973, Ser. No. 401,428
Int. Cl.² C04B 35/56
U.S. Cl. 427—430 7 Claims

1. A process suitable for treating cemented refractory carbide bodies, said process comprising:

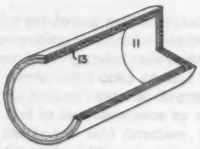
a. immersing an uncoated cemented carbide body in an aqueous slurry consisting essentially of a cobalt source, a hydrazine compound and a buffering agent to provide a pH greater than 7 and;

b. maintaining the temperature of the slurry at from about 65°C to about 90°C for greater than 10 minutes.

3,947,617
COATED CONTAINER

Gene Gerek, and Robert G. Coucher, both of Salt Lake City, Utah, assignors to EPPCO, Salt Lake City, Utah

Filed July 8, 1974, Ser. No. 486,464
Int. Cl.² B65D 25/14
U.S. Cl. 428—35 15 Claims



1. A food container comprising:

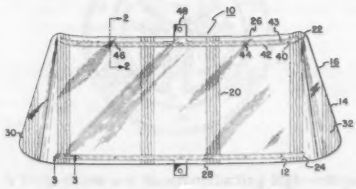
a. a thin-walled metal container having a closed end and an open end;

b. a continuous comestible resinous epoxy coating cured with dicyandiamide or substituted dicyandiamide covering the interior of said container and end, said interior coating having a thickness of less than 1 mil and being free of low molecular weight organic matter.

3,947,618
ELECTRICALLY HEATED TRANSPARENT PANEL

George A. Gruss, Mentor, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 302,501, Oct. 31, 1972, abandoned. This application Feb. 22, 1973, Ser. No. 334,875
Int. Cl.² B32B 15/00, 17/06
U.S. Cl. 428—49 1 Claim



1. In a composite sheet member for a laminated safety glass construction which comprises a layer of transparent thermoplastic polymer which has been heat-shrunk from its original dimensions by heating to an elevated temperature having partially embedded in one major surface a plurality of wrinkled resistance wires which lie in closely spaced relationship and are oriented with respect to one another in non-parallel random fashion so that portions of said individual resistance wires protrude from said major surface of the thermoplastic polymer layer, and bus-bar electrode means connected at each end of the individual resistance wires, the improvement wherein said bus-bar electrode means consist of a thin foil strip having a segmented construction which is secured by heat-bonding directly to the thermoplastic polymer layer at each end of the individual resistance wires with a continuous foil strip of greater width and thickness which overlays the subjacent segmented strip and is also heat-bonded directly to the thermoplastic polymer layer at each end of said individual resistance wires, and wherein the individual resistance wires are positioned between said continuous foil strip and the subjacent segmented strip so that portions of the segmented foil strip partially envelops said individual resistance wires and there is physical and electrical contact between said foil strips.

3,947,619
METHOD OF JOINING FABRICS

Joachim Wank, Zons, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 15, 1974, Ser. No. 514,415
Claims priority, application Germany, Oct. 17, 1973, 2352038
Int. Cl.² B65H 69/06
U.S. Cl. 428—57 14 Claims

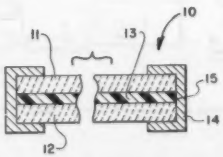
1. A method of making a high temperature resistant shrinkable joint in a fabric which comprises impregnating the ends of a fabric with a highly volatile solvent which does not dissolve the fabric, disposing a thin high temperature-resistant shrinkable strip of film, soluble in said highly volatile solvent, between the overlapping or on the abutting ends of the fabric and applying pressure to the ends of the fabric to produce the joint.

12. A length of fabric including at least one high temperature-resistant shrinkable joint prepared by the method which comprises impregnating the ends of a fabric with a highly volatile solvent which does not dissolve the fabric, disposing a thin high temperature-resistant shrinkable strip of film, soluble in said highly volatile solvent, between the overlapping or on the abutting ends of the fabric and applying pressure to the ends of the fabric to produce the joint.

3,947,620
LIGHT TRANSMISSIVE LAMINATES

William J. Plant, Glenshaw, Pa., and John J. Szwarc, Fredonia, Wis., assignors to Freeman Chemical Corporation, Port Washington, Wis.

Division of Ser. No. 314,387, Dec. 12, 1972, abandoned. This application Aug. 23, 1974, Ser. No. 500,088
Int. Cl.² H01J 29/00, 31/00
U.S. Cl. 428—68 2 Claims



1. A multiple layer light transmissive laminate comprising at least two light transmissive sheets separated by a cured light transmissive resin composition which is essentially free of residues of oxygen generating polymerization initiators, said resin serving as a binder between the said two sheets, and

sealing means spanning the space between the two said sheets over the entire perimeter thereof to preclude exposure of the resin to air.

2. In a television picture tube assembly:

a glass faceplate and a glass safety coverplate overlying and spaced apart from said faceplate,

a clear laminating plastic between said faceplate and said coverplate substantially bubble-free,

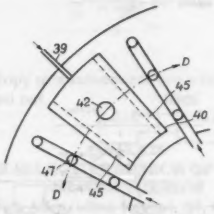
said plastic being substantially entirely cured by addition polymerization of ethylenic unsaturation groups and being substantially free of residues of oxygen generating polymerization initiators,

and sealing means along the entire perimeter of said laminating plastic spanning the space between the edges of the said faceplate and the said coverplate to preclude exposure of the said plastic to air.

3,947,621
FURNACE AND METHOD FOR REDUCING METAL OXIDES TO MOLTEN METAL

Per Harald Collin, Falun, and Yngve Sundberg, Vasteras, both of Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Mar. 13, 1975, Ser. No. 558,177
Claims priority, application Sweden, Mar. 15, 1974, 7403480
Int. Cl.² F27B 3/08
U.S. Cl. 13—23 12 Claims

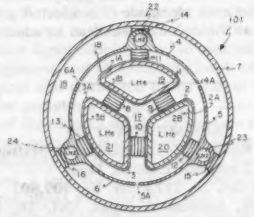


1. A furnace for producing molten metal from particulated metal oxides, comprising an annular hearth having a radially corrugated bottom forming radial valleys interspaced by radial ridges, a bed of particulated coke on said bottom and which is continuous in the bottom's annular direction, electric means for heating said bed to incandescence by an electric current passed through the bed in said direction, feeding means for feeding said oxides and additional particulated coke to said bed, said oxides being reduced by the incandescent bed to molten metal which flows into said vallyes, and means for removing said molten metal from said valleys so that said ridges prevent the molten metal from forming a melt that is continuous in said annular direction.

3,947,622
VACUUM INSULATED A-C SUPERCONDUCTING CABLES

Peter Graneau, Concord, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jan. 3, 1975, Ser. No. 538,430
Int. Cl.² H01B 12/00
U.S. Cl. 174—15 S 11 Claims

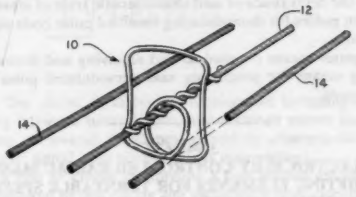


1. A three-phase a-c superconducting high-voltage cable, that comprises: three longitudinally extending hollow superconductors in a trefoil configuration cooled internally by a cryogenic fluid and in a vacuum environment; three longitudinally extending metallic heat shields disposed radially outward from the three superconductors, the heat shields being cooled by a cryogenic fluid and being electrically isolated from one another and from the hollow superconductors; and a longitudinally extending metallic vacuum enclosure disposed radially outward from the heat shields and electrically isolated therefrom and from the superconductors.

3,947,623
LIMITED CONTACT SEPARATOR FOR LINEAR BODIES

Harrison L. Williams, Euclid, Ohio, assignor to Preformed Line Products Co., Cleveland, Ohio

Filed Apr. 14, 1975, Ser. No. 567,729
Int. Cl.² H02G 7/12
U.S. Cl. 174—146 6 Claims

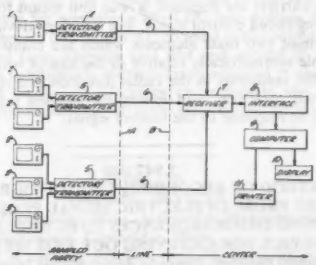


1. An appliance for linear bodies which will maintain adjacent linear bodies in spaced relationship, comprising:
a substantially planar spacing member having a generally rectangular shape with concave lateral portions; and
a pair of helically preformed attaching elements, each said element being positioned centrally of said spacing member and extending outwardly therefrom in a direction substantially normal to the plane of said spacing member.

3,947,624
SYSTEM FOR CONDUCTING A TELEVISION AUDIENCE SURVEY

Nobuo Miyake, Yokohama, Japan, assignor to Totsu Co. Ltd., Tokyo, Japan

Filed Nov. 1, 1974, Ser. No. 520,049
Claims priority, application Japan, Mar. 8, 1974, 49-026232
Int. Cl.² H04N 7/02
U.S. Cl. 178—6 4 Claims



1. Apparatus for conducting a television audience survey comprising:
means operatively coupled to the channel selector switch of each television receiver in a sampled household for detecting the position thereof and for generating a pulse code signal including a plurality of data bits indicative of said position;
means for generating a characteristic train of identification pulses;

means for adding and transmitting over a transmission means said train of identification pulses followed by said pulse code signal;

means operatively coupled to the on/off switch of each said television receiver for detecting the operation thereof and for automatically activating said channel selector switch position detecting means, said identification pulses generating means, and said adding and transmitting means when a said television receiver is turned on so as to automatically and continuously transmit over said transmission means said train of identification pulses and said pulse code signal for each television receiver which is on;

means at a survey center connected to said transmission means for receiving information thereon and responsive to the occurrence of said characteristic train of identification pulses for demodulating received pulse code signals; and

computer means coupled to said receiving and demodulating means for processing said demodulated pulse code signals.

3,947,625

ELECTRICALLY CONTROLLED RADIAL MASS SHIFTING ELEMENTS FOR TURNTABLE SPEED REGULATION IN AN APPARATUS FOR READING DISC-SHAPED INFORMATION CARRIERS

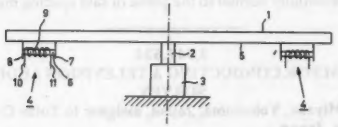
Peter Ferdinand Greve, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 14, 1974, Ser. No. 523,714

Claims priority, application Netherlands, Sept. 13, 1974, 7412154

Int. Cl.² H04N *5/76*; G11B *17/00*, *19/28*

U.S. Cl. 178—6.6 DD **5 Claims**



1. An apparatus for reading disc-shaped information carriers which are provided with substantially circular tracks, in which information is stored in coded form, in particular picture information, comprising a turntable on which said information carriers are disposed, a read unit means for supplying a reading speed control signal, and a control device comprising at least two mass elements which are connected to the turntable symmetrically relative to the axis of rotation of the turntable, resiliently in the radial direction and rigidly in the tangential direction, and means for moving said elements radially in response to the control signal.

3,947,626

METHOD OF RECORDING CINEMATOGRAPHIC IMAGES FROM AN ELECTRIC SIGNAL PRODUCED BY SCANNING IMAGE SEQUENCES TO BE DISPLACED AND DEVICE FOR CARRYING OUT THIS METHOD

Jean Robert Perilhou, Bourg-la-Reine; Michel Jacques Simeon, Aulnay sur-Seine Bois, and Dominique Yves Marie Taupin, Paris, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 27, 1974, Ser. No. 455,240

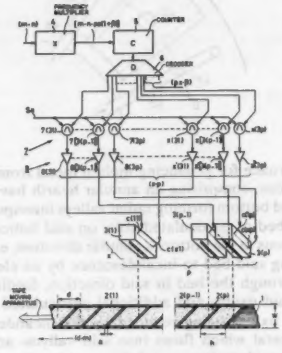
Claims priority, application France, Mar. 30, 1973, 73.11532

Int. Cl.² H04N *1/24*

U.S. Cl. 178—6.6 R **9 Claims**

1. A device for recording cinematographic images from an electrical signal provided by a television type scanner that scans the images at a frame frequncy m and at a line frequency n on a longitudinally moving electrosensitive tape shaped record carrier, comprising:

a. an array of p separate ordered recording carrier scanning heads arranged along the direction of motion of said record carrier and adjacent said carrier, a plurality of ordered separate electrodes in each of said heads, the electrodes of each head being aligned in a direction extending perpendicularly to the direction of motion of said carrier, the spacing between electrodes of all adjacent heads being equal to d, each electrode of all p recording heads being located at a different distance from the longitudinal edge of said tape-shaped carrier measured in a direction perpendicular to the direction of motion of said carrier,



b. said tape at a velocity $V = (d)\ (M)$, the head at the end of the array of heads that first scans said carrier hereinafter being referred to as the p^{th} head, and the head at the opposite end of the array hereinafter being referred to as the first head, and

c. switching means connected to said electrodes for sequentially selecting x different groups of p electrodes, each electrode of any group of electrodes having the same order as all the electrodes of said group, and for sequentially selecting each electrode of a selected group in the same order as the order of the head to which the electrode is connected.

3,947,627

FACSIMILE SYSTEM

Yutaka Tanaka, Kadoma, Japan, assignor to Matsushita Electric Industrial Company, Limited, Japan

Filed Oct. 26, 1973, Ser. No. 409,803

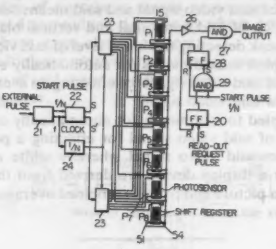
Claims priority, application Japan, Oct. 30, 1972, 47-109173; Nov. 2, 1972, 47-110108; Nov. 2, 1972, 47-110109; Nov. 4, 1972, 47-111052; Nov. 4, 1972, 47-111053; Nov. 4, 1972, 47-111054; Nov. 4, 1972, 47-111055; Dec. 6, 1972, 47-122728; Nov. 4, 1972, 47-111054

Int. Cl.² H04N *1/12*

U.S. Cl. 178—7.1 **3 Claims**

1. A method for scanning an image on a subject copy using an array of charge storage type photosensors of a facsimile transmitter, comprising the steps of: driving said array of photosensors in a sequence at a predetermined constant speed repeatedly along a single line path to produce a video signal;

gating out said video signal onto a transmission means when said transmission means is ready for transmission; and shifting

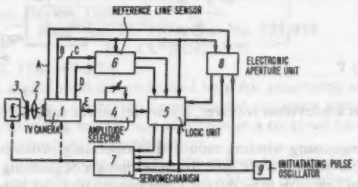


said subject copy to a subsequent line when said video signal has been gated out.

3,947,628
DEVICE FOR SELECTIVE SEARCH OF OBJECTS USING IMAGES THEREOF

Imant Karlovich Alien, ulitsa Raunas, 45, kv. 32; Jury Olegovich Popov, ulitsa Veidenmauma, 24. kv. 3; Lev Isaakovich Stolov, ulitsa Daugavgrivas, 132/1, kv. 22; Boris Albertovich Yanson, ulitsa B. Altonovas, 8, kv. 1; Igor Alexandrovich Markov, ulitsa Gorkogo, 105, kv. 11, and Anatoly Vasilievich Nikonenko, ulitsa Lokomativas, 98, kv. 16, all of Riga, U.S.S.R.

Filed Aug. 21, 1974, Ser. No. 499,182
Int. Cl.² H04N *7/18*
U.S. Cl. 178—6.8 **6 Claims**

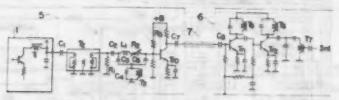


1. A device for selective search of objects using images thereof comprising: a TV-camera for producing video signals of the object's image and the current values of geometric parameters of the object's image; an amplitude selector whose input is connected to the output of said TV-camera for adjusting the video signal clipping level so that it corresponds to the preset brightness and chromaticity levels of the object's image; a logical unit connected to the output of said amplitude selector for presetting the reference values of geometric parameters of the object's image, to measure the current values of geometric parameters of the object at the preset brightness and chromaticity levels and to compare them with the reference values; a servomechanism for controlling the displacements of the object with respect to said TV-camera and having its input connected to the output of said logical unit and the output connected to produce relative motion between said TV-camera and said object; an initiating pulse oscillator connected to the inputs of said logical unit and said servomechanism; a reference line sensor connected to said logical unit for picking out at least one of the TV-camera raster lines to be used as the basis for said measurements of the current values of said geometric parameters of the object's image at the moment when the image crosses the raster line in the course of said mutual displacement of the object and said TV-camera.

3,947,629
TELEVISION RECEIVER IF CIRCUITRY

Toshihide Tanaka, Osaka; Seiji Fujisawa, Ikoma, and Susumu Ide, Katano, all of Japan, assignors to Matsushita Electric Industrial Company, Ltd., Osaka, Japan

Continuation of Ser. No. 373,414, June 25, 1973, abandoned. This application June 4, 1975, Ser. No. 583,855
Claims priority, application Japan, June 30, 1972, 47-66121
Int. Cl.² H04N *5/44*; H04B *1/16*
U.S. Cl. 178—7.3 R **1 Claim**



1. The claim: A television receiver set including a tuner casing having a tuner circuit, and a circuit means for determining an overall frequency selectivity characteristic of a video IF signal, said circuit means comprising:

a. a first IF circuit comprising a first printed circuit board secured to said casing and including a filter circuit having a helical filter and an adjacent channel trap having an output and connected to said helical filter through a capacitor for determining a portion of said overall frequency selectivity characteristic and providing the video IF signal, and

b. a second IF circuit being adjusted for determining the portion of said overall frequency selectivity characteristic and comprising a second printed circuit board separated from but electrically connected through a shielded wire to said first IF circuit and including means for amplifying the video IF signal, said second IF circuit and said shielded wire being adjusted with respect to the portion of the overall frequency characteristic determined by said first IF circuit, wherein said first IF circuit further includes an impedance conversion circuit connected between said channel trap and said shielded wire and having a low impedance for suppressing the influence of deviations possibly caused in the adjustment of the shielded wire and the second IF circuit to the first IF circuit, said conversion circuit comprising a transistor, a first resistor of a low impedance pure resistance connected as a collector output load of said transistor to said shielded wire, a second resistor connected to the emitter of said transistor, and a base bias circuit connected to the base of said transistor for applying a fixed DC bias voltage thereto, and wherein said base is AC coupled to the output of said channel trap, whereby said first and second IF circuits can be substantially independently adjusted to obtain the overall frequency selectivity characteristic and mutual adjustment therefor of both circuits can be dispensed with.

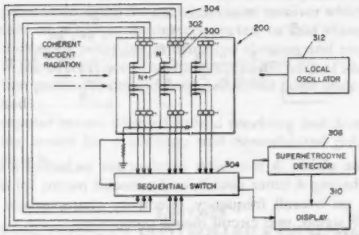
3,947,630
IMAGING DEVICES

Ali Javan, Cambridge, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 389,783, Aug. 20, 1973, which is a continuation-in-part of Ser. No. 62,380, Aug. 10, 1970, Pat. No. 3,755,678. This application Dec. 19, 1974, Ser. No. 534,157
Int. Cl.² H04N *3/16*
U.S. Cl. 178—7.1 **7 Claims**

1. An imaging system employing an array of devices, each of said devices being an electronic device responsive to optical radiation incident thereupon to generate an electrical effect dependent upon the said incident radiation, and comprising a solid non-metallic substrate, a solid metal deposit thereon, a solid dielectric layer upon a portion of said metal deposit, and

a second solid metal deposit on said substrate, said second metal deposit having a limited common area with said first metal deposit the respective common portions of said metal deposits being in intimate contact with opposite sides of and separated by said dielectric layer, said dielectric layer being of limited thickness said common region thereby defining a metal to metal junction, a portion of one of said metal deposits extending away from said junction having a width related to the wave length of said optica radiation and forming an antenna responsive to said incident radiation to generate an alternating electrical current at the frequency of said radiation and to conduct said current to said junction, said junction having a non-linear current-voltage characteristic with respect to said current whereby said current and said junction can interact to produce said electrical effect, said devices distributed to resolve an area upon which radiation is incident, each of said devices effective, upon incidence of radiation thereon, to produce a voltage across its junction, and means to read out said voltages in a repeated fashion.

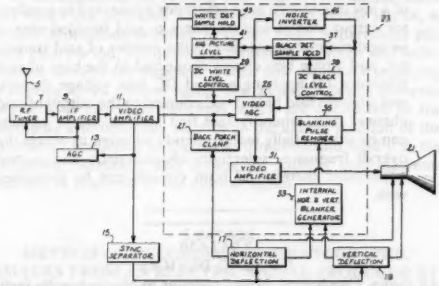


3,947,631

AUTOMATIC VIDEO SIGNAL CONTROL CIRCUIT

Dong Woo Rhee, Williamsville, and Joseph Edward Thomas, Batavia, both of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Feb. 27, 1974, Ser. No. 446,396
Int. Cl.² H04N 5/16
U.S. Cl. 178—7.3 R **23 Claims**



1. In a signal receiver providing a source of video signals, a source of flyback pulse signals, and a source of vertical deflection signals in response to transmitted television signals containing video signals and horizontal and vertical blanking signals, an automatic video signal control circuit comprising:

means coupled to said source of video signals for automatically controlling the gain of said video signal;

means coupled to said source of flyback pulse signals and said source of vertical deflection signals for developing pulse signals having a width greater than the width of said horizontal and vertical blanking signals;

means coupled to said means for developing pulse signals having a width greater than the width of said horizontal and vertical blanking signals for effecting cancellation of said horizontal and vertical blanking signals;

means coupled to said means for automatically controlling the gain of said video signal and said means for effecting cancellation of said horizontal and vertical blanking signals for peak detecting the black level of said video signal;

means coupled to said means for automatically controlling the gain of said video signal for effecting an average white level from said video signal;

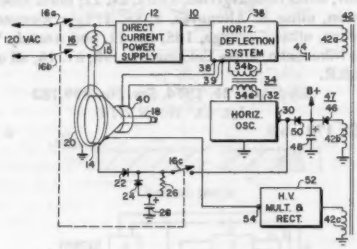
means coupled to said means for automatically controlling the gain of said video signal for effecting a peak white level from said video signal whereby white and black levels for a display device are derived from the darkest scene of a picture and from a combined average and peak brightness scene of a picture.

3,947,632

START-UP POWER SUPPLY FOR A TELEVISION RECEIVER

Robert John Giger, and James Michael Lawrence, both of Indianapolis, Ind., assignors to RCA Corporation, New York, N.Y.

Filed July 23, 1975, Ser. No. 598,296
Int. Cl.² H01J 29/06
U.S. Cl. 178—7.5 **11 Claims**



1. In a television receiver, a start-up power supply comprising:

a degaussing winding mounted in operating proximity to a television picture tube for developing a degaussing flux in said picture tube during a degaussing interval; means for coupling said degaussing winding to a first source of varying amplitude alternating current potential.

a secondary winding coupled to said degaussing winding for developing a second alternating current potential proportional to the amplitude of said degaussing flux during said degaussing interval; and

power supply means coupled to said secondary winding for developing a first direct current potential during said degaussing interval.

3,947,633

CIRCUIT ARRANGEMENT FOR DEMODULATING A FREQUENCY-DIFFERENTIAL, PHASE-MODULATED SIGNAL

Erich Burger, Unterpfaffenhofen, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Nov. 7, 1974, Ser. No. 521,913
Claims priority, application Germany, Nov. 19, 1973, 2357655
Int. Cl.² H04L 27/24
U.S. Cl. 178—67 **5 Claims**

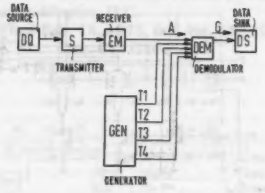
1. In a data transmission system using frequency-differential phase modulation wherein a source forms a transmitted signal that is constituted by a plurality of frequency difference phase modulated carriers, and wherein the transmitted data is recovered in the form of binary words indicative of the phase states

of said carriers, apparatus for demodulating said frequency differential phase modulated composite signal, comprising:

means for receiving said transmitted signal,

a plurality of correlator means responsive to the signals received to produce d.c. signals which are indicative of the phase states of said carriers,

time multiplexer means for connecting successively outputs of two of said correlator means to two outputs of the time multiplexer,



phase modulation means having inputs coupled to outputs of said time multiplexer means and for producing, in response to said time multiplexer output signals, phase modulated signals having zero crossovers which are indicative of the phase states of said carriers and

phase sensitive analog-digital converter means for producing from said phase modulated signals binary words which are indicative of the phase states of said carriers.

3,947,634

SYSTEM FOR SYNCHRONIZING LOCAL PSEUDO-NOISE SEQUENCE TO A RECEIVED BASEBAND SIGNAL

William L. Betts, St. Petersburg, Fla., assignor to NCR Corporation, Dayton, Ohio

Filed Nov. 21, 1974, Ser. No. 525,910

Int. Cl.² H04L *7/00*

U.S. Cl. 178—69.5 DC **7 Claims**

1. A digital modulation locked loop for generating and for synchronizing a generated demodulation sequence signal with a corresponding modulation sequence in a received baseband signal, comprising in combination:

means for generating an early phase pseudo-noise demodulation sequence signal the phase of which is controlled by the pulse rate of a train of modified clock pulses, which means when in a phase locked condition maintains the phase of said pseudo-noise demodulation sequence signal advanced in phase with respect to the phase of the pseudo-noise modulation sequence of the received baseband signal;

delay means for delaying said generated early phase pseudo-noise demodulation sequence signal by fixed amounts to provide a delayed in-phase pseudo-noise demodulation sequence signal and an in-phase demodulation sequence signal;

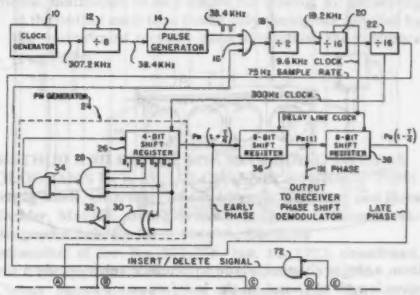
means for correlating said early phase pseudo-noise demodulation sequence signal and the delayed in-phase pseudo-noise demodulation sequence signal with the modulation sequence signals of the received baseband signal to provide correlation signals the levels of which are indicative of the degree of correlation;

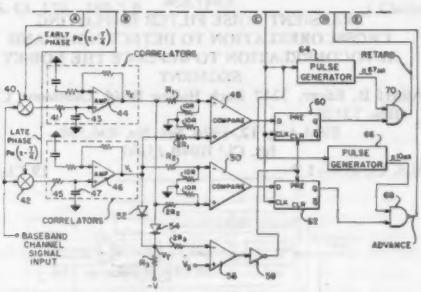
means for establishing fixed reference signals about levels encompassing the levels corresponding to desired degrees of correlation;

comparing means for comparing the levels of said correlation signals against said fixed reference signals to provide comparing signals indicative of the deviation of said correlation signals from the levels encompassed by said fixed reference signals;

clock means for providing a train of clock pulses to said means for generating an early phase pseudo-noise demodulation sequence signal; and

means for inserting or deleting pulses into said provided train of clock pulses as a function of the deviation indicated by said comparing signals so as to provide a train of modified clock pulses for increasing the correlation of said early phase pseudo-noise demodulation sequence signal and said





delayed in-phase pseudo-noise demodulation sequence signal with said modulation sequence in said baseband signal to maintain synchronization between said in-phase modulation sequence signal and the corresponding modulation sequence in said received baseband signal.

3,947,635

INTEGRATED STEREO SPEAKER SYSTEM

Charles W. Frankman, 758 Washington Ave., Greenville, Ohio 45331

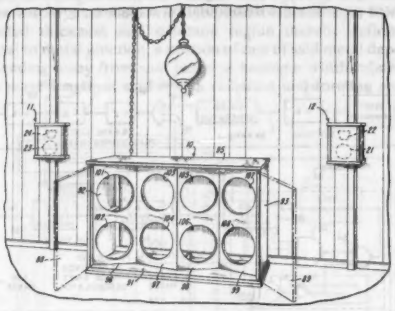
Filed Sept. 12, 1973, Ser. No. 396,484

Int. Cl.² H04R *5/02*

U.S. Cl. 179—1 E **6 Claims**

1. An integrated stereo speaker system supplying multichannel amplified sound deriving from a stereo production, including a bass speaker enclosure and relatively separated right and left upper range satellite speaker means, said bass speaker enclosure embodying a plurality of bass speaker means arranged to exclusively receive all sound waves from said channels which are in a low frequency range, and means for providing that the sound waves in a treble range and an overtone range in the respectively different channels are supplied exclusively to said right and left upper range speaker means, said bass speaker means including a pair of speakers for each channel, said speakers being paired to have the central axes of each pair converge in a direction outwardly of said enclosure and the pairs of speakers being mounted in such

side by side relation that the sounds from the respective paired speakers, each pair of which is adapted to transmit sounds



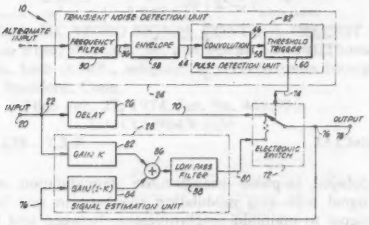
from a single channel, blend to produce substantially a single wave length of sound, in the low frequency range.

3,947,636

TRANSIENT NOISE FILTER EMPLOYING CROSSCORRELATION TO DETECT NOISE AND AUTOCORRELATION TO REPLACE THE NOISEY SEGMENT

Albert D. Edgar, 3217 Rock Hollow Road, Oklahoma City, Okla. 73120

Filed Aug. 12, 1974, Ser. No. 496,590
Int. Cl.² H04B *15/00*
U.S. Cl. 179—1 P **19 Claims**



1. A method for substantially eliminating transient noise pulses in an input signal, comprising the steps of:

receiving the input signal containing transient noise pulses;

producing a first signal through filtering of the input signal within selected frequency limits;

producing a second signal by detecting the absolute amplitude envelope of the first signal;

developing an envelope signal from said second signal and convolving said envelope signal with a predetermined filter function to generate a convolution signal;

detecting pulses in the convolution signal which have predetermined pulse amplitude and duration characteristics;

producing a detection signal when one of said pulses is detected;

receiving the input signal and producing a third signal delayed relative to the input signal by a preselected duration;

receiving the input signal and producing a fourth signal which is a time weighted estimate of the third signal in time versus amplitude; and

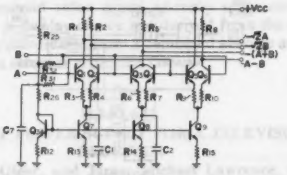
switching between the third signal and fourth signal as controlled in response to production of said detection signal to produce an output signal.

3,947,637

SIGNAL COMPOSING CIRCUIT

Kunio Seki, Hinode, and Susumu Takahashi, Tokyo, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Sept. 26, 1974, Ser. No. 509,339
Claims priority, application Japan, Sept. 26, 1973, 48-108199; May 8, 1974, 49-50289
Int. Cl.² H04R *5/00*; H03G *3/30*
U.S. Cl. 179—1 GQ **10 Claims**



1. A signal composing circuit for obtaining a plurality of output signals which are a function of a plurality of input signals comprising:

first means for obtaining an output signal which is representative of the inversion of an input signal applied thereto, including

a first and a second amplifier element each having a first, a second and a third electrode,

a first and a second resistive element one of the ends of which are connected to the first electrodes of said first and second amplifier element, respectively, the other ends of said first and second resistive elements being connected in common,

first constant current means connected between the commonly connected other ends of the first and second resistive elements and ground potential,

first load means connected between said second electrode of said first amplifier element and a voltage supply, and

first bias means, connected to the third electrodes of said first and second amplifier elements, for supplying substantially equal D.C. bias voltages to the third electrodes thereof, respectively,

said input signal being applied to said third electrode of the first amplifier element, and said output signal being derived from said first load means; and

second means for obtaining an output signal which is representative of the difference of two input signals applied thereto, including

a third and a fourth amplifier element each having a first, a second and a third electrode,

a third and a fourth resistive element one of the ends of which are connected to the first electrodes of said third and fourth amplifier elements, respectively, the other ends of said third and fourth resistive elements being connected in common,

second constant current means connected between said commonly connected other ends of the third and fourth resistive elements and ground potential,

second load means, having a resistance value which is substantially equal to that of said first load means, connected between the second electrode of one of said third and fourth amplifier elements and said voltage supply,

second bias means, connected to the third electrodes of said third and fourth amplifier elements, for supplying substantially equal D.C. bias voltages to the third electrodes thereof, respectively,

said two input signals being applied to the third electrodes of said third and fourth amplifier elements, respectively, and said latter output signal which is the difference between said two input signals, being derived from said second load means; and

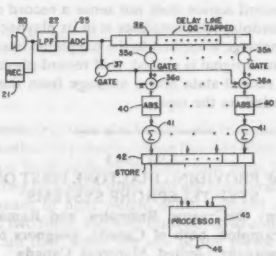
third bias means, connected to said first and second constant current means, for causing each D.C. constant current of said first and second constant current source means to be substantially equal to each other, whereby the D.C. levels of said output signals of said first and second means are subtantially equal to each other.

3,947,638

PITCH ANALYZER USING LOG-TAPPED DELAY LINE

William A. Blankinship, Annapolis, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 18, 1975, Ser. No. 550,309
Int. Cl.² G10L 1/00
U.S. Cl. 179—1 SA 4 Claims



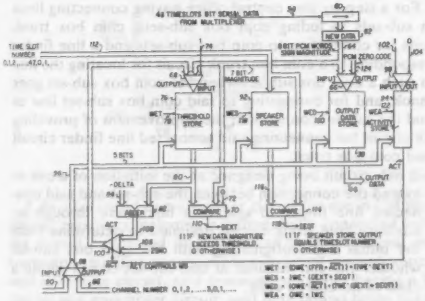
1. A pitch analyzer, comprising:
means for digitizing an analog speech signal;
a delay line into which said digitized signal may be sequentially inserted;
means for periodically extracting the contents of selected stages of the delay line, the selected stages being spaced at substantially logarithmic intervals; and
means for periodically testing said extracted contents to determine an optimum choice of pitch period.

3,947,639

SELECTIVE SWITCHING APPARATUS

David C. Nicholas, Cedar Rapids; Willard J. Torgrim, Springville, and John C. Kleitsch, Cedar Rapids, all of Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Sept. 30, 1974, Ser. No. 510,534
Int. Cl.² H04M 3/56
U.S. Cl. 179—1 CN 6 Claims



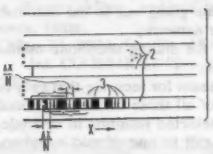
2. Apparatus for determining which source of a plurality of source derived input signals should be used for providing an output signal to a destination at the end of each of a plurality of time frames comprising, in combination:
means for periodically sampling the magnitude of the signals for each of said sources;
means, connected to said last named means, for storing the magnitude of a sampled signal as a new reference whenever the magnitude of the sampled signal exceeds the amplitude of a previously established reference;
means, connected to said means for storing, for decreasing the magnitude of the reference as a function of time; and
means, connected to said means for storing, for presenting at the output each time frame only the signals supplied by the source most recently used to establish the reference magnitude.

3,947,640

METHOD AND DEVICE FOR RECORDING DATA AS HOLOGRAMS IN A MULTI-CHANNEL STORAGE TAPE

Hartwig Ruell, Otterfing; Dietlind Pekau, Krailling, and Hans Eschler, Munich, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Continuation of Ser. No. 322,356, Jan. 10, 1973, abandoned.
This application Nov. 6, 1974, Ser. No. 521,386
Claims priority, application Germany, Jan. 24, 1972, 2203246
Int. Cl.² G11B 7/00; H04N 5/84
U.S. Cl. 179—100.3 B 1 Claim

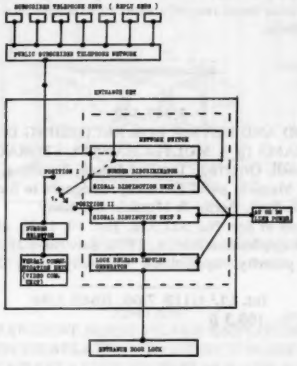


1. A method of recording a plurality of one-dimensional holograms containing analog or digital data sequentially in multi-channels on a storage tape comprising providing a tape having a plurality of parallel channels extending along a tape direction; moving the tape in the tape direction; pulse amplitude modulating a laser beam to produce an object beam having a plurality of modulated pulses with each modulated pulse containing a signal to be recorded; providing a reference beam; combining the object beam and reference beam into a commonly directed beam by focusing one of the beams with a cylindrical lens through a beam splitting device and by focusing the other of the two beams with a second cylindrical lens at the beam splitting device; directing the combined object beam and reference beam through a beam deflecting means and focusing the beams with a third cylindrical lens onto the storage tape; sequentially deflecting both the object beam and the reference beam consecutively on the channels of the storage tape with the direction of deflection extending perpendicular to the tape direction to produce a recording cycle extending transversely across the channel to record one-dimensional holograms in each of the channels sequentially wherein each one-dimensional hologram corresponds to each modulated pulse with the contrast of the hologram being a measure of the amplitude of the modulated pulse.

3,947,641
USE OF PUBLIC SUBSCRIBER TELEPHONE NETWORK; METHOD AND APPARATUS

Anders Edvard Trell, Polhemsgatan 20 B4, 11236 Stockholm, Sweden

Filed June 3, 1974, Ser. No. 475,646
Claims priority, application Sweden, June 7, 1973, 7308086
Int. Cl.² H04M *11/08*
U.S. Cl. 179—2 A **13 Claims**



4. In combination with a public automatic subscriber telephone network an apparatus having connecting means by which the apparatus can be connected to a door lock, comprising:

switching means by which said apparatus can be coupled onto a telephone line going out to the automatic exchanges of said telephone network;

selecting means for dialing telephone numbers to said telephone network;

discriminating means for securing that only certain telephone numbers out of all those of the whole said telephone network can be selected resulting in said telephone networks performing a call to one of said telephone networks subscriber telephone sets;

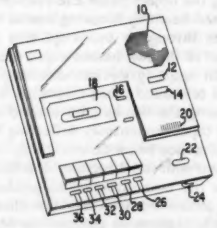
means for verbal communication with said subscriber telephone; and

means responsive to signals induced from said subscriber telephone for thereupon releasing said door lock.

3,947,642
TELEPHONE ANSWERING SYSTEM AND APPARATUS

George M. Meyerle, New Milford, Conn., assignor to B.S.R. (U.S.A.) Ltd., Blauvelt, N.Y.

Filed Aug. 26, 1974, Ser. No. 500,247
Int. Cl.² H04M *1/64*
U.S. Cl. 179—6 R **11 Claims**

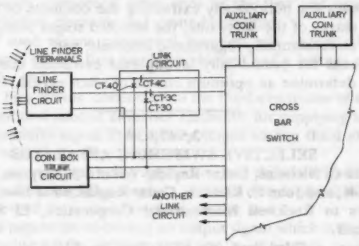


1. A telephone answering device which connects to the telephone line and uses partially prerecorded magnetic recording tape comprising a tape transport mechanism having a magnetic record-playback head and an electric drive motor for moving the magnetic recording tape in a controlled manner across said record-playback head; a motor control circuit for operating said tape transport motor; a record-playback amplifier which in its playback state amplifies an electrical signal from said record-playback head and applies the amplified signal to the telephone lines, in its record state amplifies an electrical signal from the telephone lines and applies the amplified signal to said record-playback head; a record sensor for sensing a record control signal prerecorded on the recording tape to control the state of the record-playback amplifier; and a ring sensor for energizing said motor control and said record sensor when a ring signal is sensed, wherein when a ring signal is sensed, said motor control circuit is energized for moving the magnetic recording tape across said record-playback head and said record sensor is energized, whereby when said record sensor does not sense a record control signal, said recordplayback amplifier is in its playback state and a recorded message is applied to the telephone lines and when a record control signal is sensed, said record-playback amplifier is in its record state and a message from the telephone lines is recorded on the tape.

3,947,643
METHOD OF PROVIDING DIALTONE FIRST ON STEP BY STEP TELEPHONE SYSTEMS

Henk Anthony DeGraauw, Bramalea, and Ramaswami Bashyam, Brampton, both of Canada, assignors to Northern Electric Company Limited, Montreal, Canada

Filed Oct. 2, 1974, Ser. No. 511,362
Int. Cl.² H04M *17/00*
U.S. Cl. 179—6.3 R **9 Claims**



1. For a step by step central office having connecting lines from sub-sets including coin box sub-sets, coin box trunk circuits for connecting to coin box sub-sets and a line finder corresponding to a coin box trunk circuit for locating the line from such a coin box sub-set when the coin box sub-set goes off-hook, and for connecting to said coin box sub-set line to extend the sub-set connection; the improvement of providing a link circuit for connecting said connected line finder circuit to said coin box trunk,

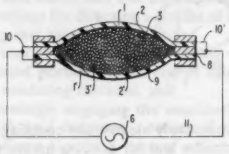
said link circuit being designed at the initiation of a call to extend the connection between the sub-set and said connected line finder to said coin box trunk through an auxiliary coin trunk circuit designed to determine from the initial digits originating with the coin box sub-set whether the call initiated at said sub-set comes within a class of no charge calls,

means in said link circuit responsive to a signal from the auxiliary coin trunk circuit consequent on a determination that said call comes within the class of no charge calls, for extending the connection from said connected line finder to said coin box trunk, so as to bypass said auxiliary coin trunk circuit.

3,947,644
PIEZOELECTRIC-TYPE ELECTROACOUSTIC TRANSDUCER

Shoji Uchikawa, Iwaki, Japan, assignor to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 18, 1972, Ser. No. 281,682
Claims priority, application Japan, Aug. 20, 1971, 46-62889
Int. Cl.² H04R 17/00
U.S. Cl. 179—110 A 7 Claims

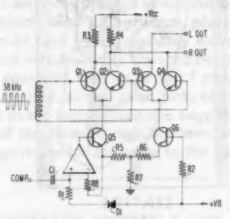


1. A piezoelectric-type electroacoustic transducer comprising two piezoelectric polyvinylidene fluoride films each having electrodes on both surfaces thereof, said films being so disposed that they face each other and are stretched into convex states by means of light weight solids inserted in the space between the two films, and said films being so connected to an electric circuit that, when the one of the piezoelectric films elongates by the action of an electric field in a direction, the other of the films shrinks by the action of the same electric field, whereby said films vibrate in phase with said solids.

3,947,645
DEMULTIPLEXER FOR FM STEREOPHONIC RECEIVERS

Takashi Mizukami, and Takuo Mouri, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sept. 13, 1974, Ser. No. 505,817
Claims priority, application Japan, Sept. 13, 1973, 48-107475[U]
Int. Cl.² H04H 5/00
U.S. Cl. 179—15 BT 3 Claims

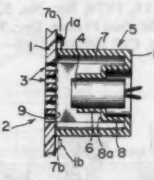


1. In a balanced demultiplexer circuit for use in FM stereophonic receivers including a differentially connected switching circuit connected to a source of switching signal and a transistor amplifier connected as a constant current source to said switching circuit, said transistor amplifier having a base circuit and an emitter circuit, said base circuit being adapted to receive an input composite signal, the improvement comprising feedback means connected between said emitter circuit and said base circuit for providing negative feedback to the input of said transistor amplifier whereby the distortion developed by said transistor amplifier is reduced.

3,947,646
RESILIENT MICROPHONE MOUNTING

Shoichi Saito, Tokyo, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan

Filed Apr. 1, 1975, Ser. No. 564,031
Claims priority, application Japan, Oct. 11, 1974, 49-122584[U]; Feb. 13, 1975, 50-20095[U]
Int. Cl.² H04R 1/28
U.S. Cl. 179—146 R 10 Claims

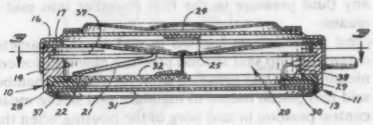


1. A microphone holder for use in an electrical instrument which internally houses a microphone, comprising a microphone supporting cylinder for mounting a microphone therein, a microphone attaching cylinder located outside the microphone supporting cylinder, and a stepped connecting cylinder for connecting the supporting and mounting cylinders together, all of the cylinders being integrally formed of a resilient material.

3,947,647
MICROPHONE HAVING IMPROVED TRANSDUCER SUPPORT

Frank Swinehart, Waseca, Minn., assignor to E. F. Johnson Company, Waseca, Minn.

Filed Mar. 21, 1974, Ser. No. 453,345
Int. Cl.² H04R 17/02
U.S. Cl. 179—179 10 Claims



1. In a microphone having a diaphragm and transducer connected to be driven thereby, the combination comprising:

a hollow housing having a top, bottom and of substantially constant lateral cross section;

elongated transducer means;

conductive means of like lateral cross section insulatedly mounted in proximity to the bottom of said housing;

an insulating washer of like lateral cross section mounted in proximity to the bottom of said housing on top of said conductive means, said washer having an inwardly, upwardly, opening notch disposed over said conductive means and adjacent to a side wall of said housing whereby the bottom of one end of said transducer means may be disposed in said opening in conductive supporting engagement on said conductive means; and

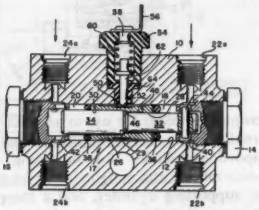
a conductive spring washer having a first portion fixedly mounted intermediate the top and bottom of said housing and having an outside lateral dimension greater than the lateral interior of said housing for more than one-half of the outer peripheral dimension of said housing, and a second portion having an outside lateral dimension less than the lateral interior dimension of said housing, but greater than that of the interior lateral dimension of said insulating washer, for less than one-half of the peripheral dimension of said housing, said last named portion ex-

tending downwardly toward the top of said insulating washer and said transducer means and in registration with the notch in said insulating washer, whereby the top of said end of said transducer is conductively engaged by the second portion of said conductive spring washer.

3,947,648
BRAKE PRESSURE IMBALANCE SWITCH

Roland Muterel, Bessancourt, France, assignor to Societe Anonyme D.B.A., Paris, France

Filed Nov. 14, 1974, Ser. No. 523,955
Claims priority, application France, Dec. 7, 1973, 73.43742
Int. Cl.² H01H *35/38*
U.S. Cl. 200—82 D **5 Claims**



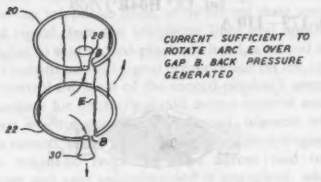
1. A brake pressure imbalance switch comprising:
a housing having a bore therein;
sleeve means slidable in said bore and separating the bore into a first pressure chamber and a second pressure chamber, said first pressure chamber being connected to a first source of fluid, said second chamber being connected to a second source of fluid, said sleeve means having an axial bore with a first diameter and a second diameter separated by a shoulder;
first piston means located in said first diameter and extending into said first pressure chamber for communicating any fluid pressure in the first chamber into said sleeve means;
second piston means located in said second diameter and extending into said second pressure chamber for communicating any fluid pressure from the second chamber into said first piston means to maintain said sleeve means in a central position in said bore of the housing when the fluid pressure in the first chamber and the second chamber is substantially equal;
pin means connected between said housing for and said second piston limiting the movement of said second piston means with respect to said sleeve means; and
cooperating contact means connected to said sleeve means for actuating an electrical circuit upon movement of said sleeve means in response to a pressure imbalance between the first chamber and the second chamber.

3,947,649
METHOD AND APPARATUS FOR ARC QUENCHING

Walter Hertz, Erlangen-Buckenhof, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed July 25, 1974, Ser. No. 491,752
Int. Cl.² H01H *33/00*
U.S. Cl. 200—144 R **30 Claims**

1. Apparatus for quenching an arc in an electric AC circuit breaker having an arc chamber in which the arc rotates between two open electrodes in a quenching medium comprising:
a. first and second electrodes arranged coaxially and parallel to each other in the arc chamber;
b. first and second leads coupled to the one respective end of each of said first and second electrodes;
c. a nozzle formed at the other end of at least one of said electrodes, said nozzle projecting through a wall of the arc chamber;
d. an equalization chamber on the other side of any wall containing a nozzle;

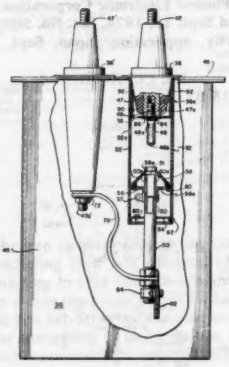


e. means for selectively electrically coupling said first and second electrodes and for drawing an arc therebetween; and
f. the discharge cross section of said nozzle in conjunction with a predetermined volume of the arc chamber being designed so that the overpressure produced by the heated quenching medium in said arc chamber is maintained beyond the zero crossing of the AC current.

3,947,650
GAS-INSULATED SWITCH FOR AN UNDERGROUND POWER DISTRUBUTION SYSTEM

Robert Allen Strain, and Gary Lee Schurter, both of St. Louis, Mo., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jan. 9, 1974, Ser. No. 432,064
Int. Cl.² H01H *33/88*
U.S. Cl. 200—148 B **13 Claims**



1. A gas-insulated switch for use in underground distribution systems, said switch comprising, in combination:
a conductive housing;
at least one pair of insulated feed-through bushings fixedly mounted to said housing, each bushing having a first conductive portion thereof external of said housing for coupling to an underground conductor termination, and each bushing having a second conductive portion internal to said housing;
first and second electrodes respectively coupled to said second conductive portions of said pair of bushings;
means for moving said electrodes relative to one another during a switching operation to alternately engage and

disengage said electrodes, wherein a circuit is completed when said electrodes engage and wherein an electric arc is drawn between said electrodes during a portion of said switching operation;

an electronegative gas within said housing for extinguishing said arc, and for electrically insulating said electrodes from one another and from said conductive housing, and wherein said gas is maintained within said conductive housing at a pressure sufficient to prevent liquefication of said gas at relatively low ambient temperatures;

means including a casing internal to said housing and surrounding said electrodes and an insulated portion of one of said bushings for directing a stream of said gas into contact with said arc during said switching operation;

wherein at least the portion of said casing which surrounds said insulated portion of said one of said bushings comprises an insulating material; and

means for sealingly engaging the insulated portion of said casing with said insulated portion of said one of said bushings along a portion thereof which is spaced apart from said second conductive portion of said one of said bushings.

3,947,651

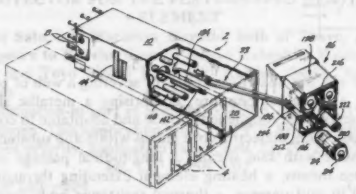
ELECTRICAL CARTRIDGE WITH INTERCHANGEABLE CIRCUITRY FOR THE CAP

Maurice D. Fuller, Mercer Island, Wash., assignor to Korry Manufacturing Company, Seattle, Wash.

Division of Ser. No. 266,305, June, 1972. This application May 13, 1974, Ser. No. 469,316

Int. Cl.² H01H 9/16

U.S. Cl. 200—314 **3 Claims**



1. In combination, an open ended cartridge having an illuminated cap reciprocably received ih the open end thereof, and a mounting base enclosed therewithin, including an electrical contact assembly through which the lamps of the cap are energized, which base comprises a plurality of tandemly-arranged blocks, and which assembly includes a printed circuit board that is replaceably clamped between a pair of such blocks, and equipped with an array of contact points on the printed face thereof, as well as an array of contact prongs that are attached to the board along one edge thereof, and extend to the rear of the face through the base, in a corresponding number of apertures for the same in the base.

3,947,652

COOKING SURFACE ASSEMBLY FOR AN INDUCTION RANGE

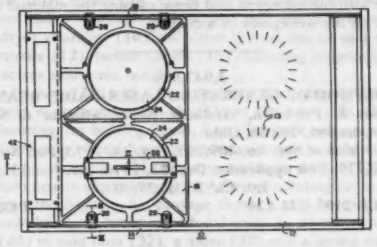
William R. Cobb, Murrysville, Pa., assignor to White-Westir.ghouse Corporation, Cleveland, Ohio

Filed June 28, 1974, Ser. No. 484,351

Int. Cl.² H05B 5/04; F24C 3/00

U.S. Cl. 219—10.79 **8 Claims**

1. A cooking surface assembly comprising an uninterrupted planar cooking top for supporting utensils containing foodstuffs to be heated, a plurality of heating units disposed adjacent the undersurface of said cooking top; a peripheral trim member for framing the periphery of said cooking top; a peripheral gasket interposed between said trim member and said top for a generally sealed interface betweem said trim and said top; a support plate disposed subadjacent said top and defining means for receiving and locating said heating units and permitting installation and removal of said heating units from below said support plate; means attached to said support plate for releasably supporting said heating units against the



undersurface of said top, said support plate further defining means for facing engagement to at least selected portions of said peripheral trim and, fastening means for joining said plate to said trim along said portions of facing engagement, said fastening means in the final assembled position concomitantly providing a compressive force to said gasket.

3,947,653

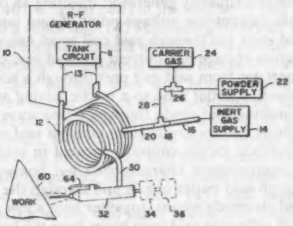
METHOD OF SPRAY COATING USING LASER-ENERGY BEAM

Thomas E. Fairbairn, Westland, Mich., assignor to Sirius Corporation, Toledo, Ohio

Division of Ser. No. 409,167, Oct. 24, 1973, Pat. No. 3,872,279. This application Dec. 12, 1974, Ser. No. 531,894

Int. Cl.² B23K 9/04

U.S. Cl. 219—76 **1 Claim**



1. In a method for spraying a coating on a workpiece with a high temperature coherent electromagnetic beam emitted from an orifice, by generating a single frequency sine wave signal in a hollow electrically conductive tubular tank coil of a radio-frequency generator; injecting an inert gas and a heat fusable material in a carrier gas into a maximum current-low voltage point of said tank coil; convey said inert gas and said material in its carrier gas separately through said coil to an exit port located at a maximum voltage low-current point of said coil; conveying said inert gas from said exit port through a hollow electrically conductive outlet tube to a nozzle having an outlet orifice; conveying said material from said exit port to said nozzle orifice; transmitting said single frequency sine wave signal from said maximum voltage low-current point of said coil around a hollow electrode means centrally located in said nozzle orifice, while maintaining said electrode means and said surrounding nozzle at the same electrical potential; the improvement characterized by generating a laser beam; conveying said laser beam through said outlet nozzle and through the hollow portion of said electrode means; and reflecting said laser beam from the hollow portion of said elec-

trode means onto said workpiece and focusing the laser beam thereon; whereby said inert gas forms an annular sheath which surrounds and focuses into a beam the high temperature coherent radio-frequency-plasma electron stream emitted from said electrode means and nozzle orifice and said material enters the beam thus emitted and is sprayed onto said workpiece with the energy in said beam causing the material to be fused on the workpiece as a coating.

3,947,654

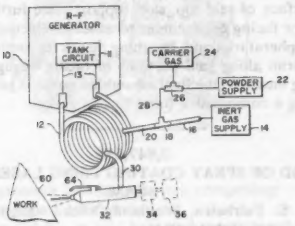
METHOD OF GENERATING LASER-RADIO BEAM

Thomas E. Fairbairn, Westland, Mich., assignor to Sirius Corporation, Toledo, Ohio

Division of Ser. No. 409,167, Oct. 24, 1973, Pat. No. 3,872,279. This application Dec. 12, 1974, Ser. No. 531,895

Int. Cl.² B23K *27/00*

U.S. Cl. 219—121 LM **2 Claims**



1. In a method for generating a high temperature coherent electromagnetic beam by generating a single frequency sine wave signal in a hollow electrically conductive tubular tank coil of a radio-frequency generator; injecting an inert gas into a maximum current-low voltage point of said tank coil; conveying said inert gas through said coil to an exit port located at a maximum voltage low-current point of said coil; conveying said inert gas from said exit port through a hollow electrically conductive outlet tube to a nozzle having an outlet orifice; transmitting said single frequency sine wave signal from said maximum voltage low current point of said coil around a hollow electrode means centrally located in said nozzle orifice; the improvement characterized by: conveying a laser beam through said outlet nozzle and through the hollow portion of said electrode means, together with a low pressure gas stream; and reflecting said laser beam from the hollow portion of said electrode means onto said workpiece and focusing the laser beam thereon, while allowing said low pressure gas stream to continue directly toward said workpiece; whereby said inert gas forms an annular sheath which surrounds and focuses the high temperature stream emitted from said electrode means and nozzle orifice into a beam.

3,947,655

CORED TYPE ELECTRODE WELDING

John Gonzalez, Willoughby, and Robert P. Munz, Lyndhurst, both of Ohio, assignors to The Lincoln Electric Company, Cleveland, Ohio

Filed May 15, 1974, Ser. No. 469,963

Int. Cl.² B23K *35/22*

U.S. Cl. 219—146 **17 Claims**

14. In an arc welding electrode for welding mild steel in air comprised of a steel tube having on the inside thereof fluxing ingredients including aluminum, the improvement which comprises: said ingredients including as an essential ingredient, a prefused composite consisting of: calcium oxide and one or more metal oxides selected from the class consisting of: silicon dioxide, manganese oxide, and iron oxide.

3,947,656

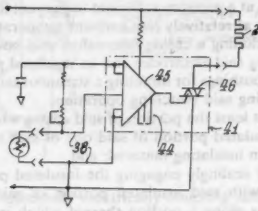
TEMPERATURE CONTROLLED CARTRIDGE HEATER

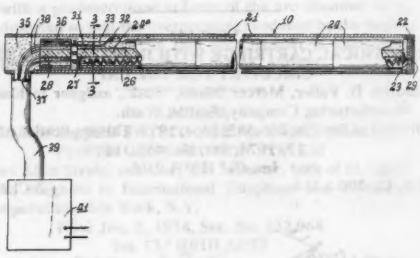
Frank Lodi, Niles, Ill., assignor to Fast Heat Element Manufacturing Co., Inc., Elmhurst, Ill.

Filed Aug. 26, 1974, Ser. No. 500,565

Int. Cl.² H05B *1/00*

U.S. Cl. 219—243 **9 Claims**





1. An electric heater assembly for severing a web of plastic film at a given temperature, comprising a metallic sheath having an outside roughened surface and adaptable to contact said plastic web, dielectric core means within and substantially coextensive with said sheath, a longitudinal passage within said core means, a heating element extending through and secured in said passage, a thermal resistance body arranged between said sheath and core means but insulated from said heating element and in surface contact with said sheath for sensing the temperature of said sheath, a circuit connecting said heating element and said thermal resistance body with a source of electric current, and means in said circuit responsive to the temperature sensed by said thermal resistance body for controlling the flow of current to the heating element to maintain said sheath at said given temperature.

3,947,657

MULTIPURPOSE FOLDABLE ELECTRIC STOVE

Samuel H. Ershler, 1050 Fifth Ave., New York, N.Y. 10028

Filed June 17, 1975, Ser. No. 587,669

Int. Cl.² H05B *3/68;* **A47J** *37/00;* **F24C** *7/10*

U.S. Cl. 219—454 **10 Claims**

1. A multipurpose foldable electric stove which comprises:

a tray having an overall flat bottom bordered by an upstanding marginal wall;

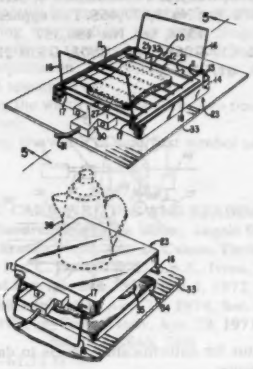
an electric-resistance heating element extending between and supported by opposed portions of said wall in adjacent spaced relation to the bottom of said tray;

a grill comprising a frame having a succession of spaced support bars extending thereacross and held in adjacent spaced relation to the upper side of said heating element by support legs the lower portions of which are disposed adjacent the inner surface of said wall with the extremities thereof supported by the bottom of said tray;

foldable legs hingedly secured adjacent opposite ends of said grill by a hinge means which permits opening said

legs from folded position substantially flush with the upper surface of said grill to unfolded upstanding position in excess of 90° with respect to the upper surface of said grill; and

stop means which limits the unfolding of said legs beyond said upstanding position,



said foldable legs being adapted to support said tray substantially spaced from a support surface on which said legs are placed when said tray is inverted with said legs in unfolded position.

3,947,658

PROTECTOR FOR THE PLATE-SHAPED HEATING ELEMENT

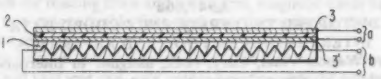
Masaki Sato, and Haruhisa Hayashi, both of Tokyo, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo and Toyo Boseki Kabushiki Kaisha, Osaka, both of, Japan

Continuation-in-part of Ser. No. 334,545, Feb. 22, 1973, abandoned. This application Mar. 21, 1975, Ser. No. 560,749

Claims priority, application Japan, Feb. 22, 1972, 47-18012

Int. Cl.² H05B *1/02*

U.S. Cl. 219—504 **1 Claim**



1. A sheet type heating assembly having a broad surface area and comprising: a protecting device composed of an intermediate resin layer having a negative temperature coefficient of resistivity and two plate shaped electrodes adhered to opposite surfaces of the intermediate layer; a sheet type heating element comprising an indefinite number of discontinuous conductive materials forming a multiple network circuit, the protecting device being combined with the heating element completely by an insulating binder; and a temperature controlling circuit connected between said electrodes and said heating element for controlling the application of electric power to said heating element to maintain the temperature of said broad surface below a predetermined value.

3,947,659

HAIR DRYER WITH A VAPOR EJECTION MEANS

Takamichi Ono, Yokohama, Japan, assignor to Takashi Tumura, Tokyo, Japan

Filed July 15, 1974, Ser. No. 488,323

Claims priority, application Japan, Feb. 14, 1973, 49-17131

Int. Cl.² H05B *1/00*; **A45D** *20/08*; **F24H** *3/04*

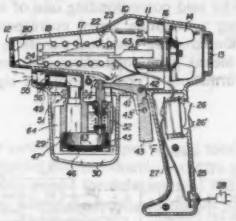
U.S. Cl. 219—362 **2 Claims**

1. A hair dryer comprising in combination:

a. a grip handle (**25**), with an upper section, an elongated upper chamber with middle and rear sections, said rear section being connected to and disposed above said upper section, in a plane substantially normal to said drip handle, a suction opening (**13**) in said rear section, a dryer chamber (**10**) in said middle section, a longitudinal main nozzle (**12**) with an outlet extending frontwards of said dryer chamber (**10**);

b. air drive means (**14, 15**) in said rear section disposed to suction air through said suction opening (**13**) into said dryer chamber (**10**) and drive the air out of said main nozzle (**12**), heater means (**18**) extending longitudinally across said main nozzle;

c. a housing (**29**) with a front and rear sides; disposed under said main nozzle, a tank (**32**) at the rear side of said housing, for holding liquid, a nozzle vapor passage at the front side of said housing under said main nozzle, a connecting aperture (**31**) between said main nozzle (**12**) and said nozzle vapor passage, to allow ventilating air to flow into the housing for passage through said housing to a ventilating air outlet provided therein, liquid outlet means (**40**) in said tank (**32**), a valve (**37**) and a spring means (**39**) biasing the valve in the closed position in said tank, feeder means connected to said valve with a trigger (**43**)



disposed alongside said handle for lifting said valve (**37**) against the force of the spring (**39**), a vaporization chamber (**65**) with a top disposed under said liquid outlet means (**40**), a heater (**46**) at the bottom of said chamber (**65**) and a vapor duct (**47**) extending from said vaporization chamber (**65**) to said nozzle vapor passage;

d. inner and outer longitudinal nozzle means (**51, 49**) in said nozzle vapor passage both with nozzle discharge ends, said outer nozzle means (**49**) surrounding said inner nozzle means (**51**) and spaced by a gap from said inner nozzle means, said outer nozzle means nozzle discharge end projecting further than said inner nozzle means (**51**) nozzle discharge end, said inner nozzle means having an inlet end coupled to said duct (**47**) said inner nozzle means being within said outer nozzle and longitudinally smaller than said outer nozzle means, the nozzle discharge end of said inner nozzle means being within the outer nozzle means and separated from the nozzle discharge end of the outer nozzle means, inwardly disposed annular flange recesses (**53, 54**) in both said nozzle discharge ends for preventing liquid drops from falling from said outer nozzle discharge end; and,

e. switch means (**26**) and a two position switch (**26'**) on said handle, a first circuit connecting said switch means (**26**) and said air drive means (**14, 15**) and a second circuit selectively connecting said switch (**26'**) in one position to said heater means (**18**) and in a second position to said heater (**46**).

3,947,660

CASH REGISTER COMPUTING SYSTEM

Yutaka Saito, No. 21, Koaza Ryuto, Aza Shimoueno, Oyamazaki-cho, Otokuni, Kyoto, Japan

Filed Oct. 3, 1974, Ser. No. 511,723

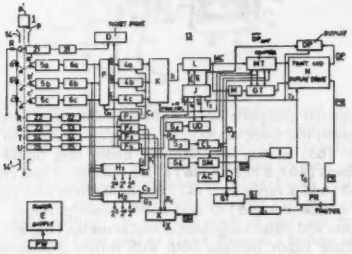
Claims priority, application Japan, Oct. 6, 1973, 48-112537

Int. Cl.² G06K *15/00*, *3/00*, *7/10*

U.S. Cl. 235—61.6 R **21 Claims**

1. Cash register computing system for furnishing first and second output signals respectively signifying the total price of a plurality of items in a transaction and the total number of

items in each of a determined plurality of categories in said transaction, comprising, in combination, a plurality of tickets each carrying machine readable price category markings respectively signifying the price and category of at least one of said items, each of said tickets having a plurality of columns and a plurality of lines intersecting said plurality of columns, said price markings being located in a first region of said ticket bounded by a first and second one of said lines, said category markings being located in a second region of said tickets different from said first region; transport means for transporting each said tickets along a predetermined path in a direction parallel to said columns; read-out means for reading out said price and category markings and furnishing corresponding price and category marking signals, positioned at a predetermined location along said predetermined path, said read-out means comprising a plurality of read-out means corresponding in number to said plurality of columns; first and second buffer storage means connected to said read-out means for, respectively, storing said price and category marking signals and furnishing corresponding stored price and stored category marking signals, said first buffer storage means comprising a plurality of counters each connected to a corresponding one of said read-out means, each for counting the price marking signals furnished by said corresponding one of said read-out means and storing a counting signal corresponging to the number of so-counted price marking signals; a plurality of position control means positioned along said predetermined path, each for furnishing a position control signal when a



predetermined part of said ticket path is at a corresponding predetermined location along said predetermined path, said position control means comprising first and second position pulse furnishing means for furnishing a first and second position pulse when said predetermined part of said ticket path is at said first and second predetermined location along said predetermined path respectively; gating means connected to said position control means and said first and second buffer storage means for controling entry of signals into said buffer storage means in response to corresponding ones of said position control signals, said gating means comprising a plurality of transmission gates connected between said read-out means and said buffer storage means, said gating means having a conductive state in the presence of a gating signal applied thereto; means for furnishing said gating signals from receipt of said first to receipt of said second position pulse; price adder means connected to said first buffer storage means for adding said stored price marking signals read from one of said tickets to price marking signals read from previous ones of said tickets in said transaction and furnishing said first output signals following the addition of stored price marking signals read from the last of said tickets in said transaction; and a plurality of category adder means connected to the output of said second buffer storage means, each for counting stored category marking signals signifying a predetermined one of said categories only, whereby said plurality of category added means furnishes said second output signals following addition of stored category marking signals read from the last of said tickets in said transaction.

3,947,661

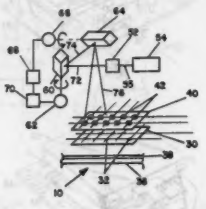
ACCESS AUTHENTICATING SYSTEM

Daniel Silverman, 5969 S. Birmingham Ave., Tulsa, Okla. 74105, and Everett A. Johnson, 15 S. Prospect Ave., Park Ridge, Ill. 60068

Continuation-in-part of Ser. No. 272,686, July 17, 1972, Pat. No. 3,818,190, which is a continuation of Ser. No. 74,066, Sept. 21, 1970, Pat. No. 3,677,465. This application June 18, 1974, Ser. No. 480,357

Int. Cl.² G06K *7/10, 19/02;* **G03B** *27/52*

U.S. Cl. 235—61.7 R **12 Claims**



1. Apparatus for authenticating access to data storage record, comprising:

a. means for preparing pattern carrier means containing a predetermined unique geometrical micro pattern applied by laser radiation;

b. means including said pattern carrier means for applying on said record an unerasable authentication pattern corresponding to said pattern on said carrier means;

c. means for passing said laser radiation through the said authentication pattern by scanning said radiation over the surface of said pattern carrier means, said micro pattern of the carrier means being applied to the record in a plurality of spaced positions thereon, the spacing between the positions being known; and

d. means including said pattern carrier means for comparing the micro pattern on said record in at least one of said positions with the authentication pattern of said pattern carrier means.

3,947,662

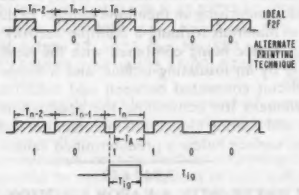
DISTORTED TWO FREQUENCY CODED DATA INTERPRETING METHOD AND APPARATUS

Albert Watson Vinal, Cary, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1974, Ser. No. 538,272

Int. Cl.² G11B *5/09*

U.S. Cl. 235—61.11 E **30 Claims**



1. In an F2F coded data decoder apparatus system, in which the time periods or widths between signal transitions corresponding to the two frequencies originally used to encode the data may be distorted by spread, when received at said decoder, so as to exhibit their signal transition points spaced at other than the original frequency transition spacing or times,

a method of operating said decoder apparatus for interpreting said distorted F2F coded data to extract therefrom its correct digital content whenever each multibit data block is preceded by at least a binary 1 preamble or first symbol having two double frequency time slots, or nominal half-symbol widths, by predicting the ieal length of an inhibiting period and controlling the duration of said inhibiting period imposed by said decoding apparatus for any said double frequency signal transition occurring intermediate the single frequency symbol boundary transitions, thereby isolating said boundary transitions for interpretation, comprising the steps performed by means in said apparatus of:

a. measuring the width of either of the two time slots in said first symbol;

b. measuring the width of said first symbol and, after said

3,947,663

MAGNETIC CARD WRITING AND READING DEVICE

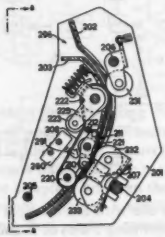
Giovanni De Sandre, Brugherio, Milan; Angelo Subrizi, Ivrea, Turin, and Franco Bretti, Are' Di Caluso, Turin, all of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Turin, Italy

Division of Ser. No. 246,735, April 4, 1972, Pat. No. 3,828,222. This application Apr. 17, 1974, Ser. No. 461,559

Claims priority, application Italy, Apr. 22, 1971, 68336/71

Int. Cl.² G06K *7/08*

U.S. Cl. 235—61.11 D **2 Claims**



1. In a desk-top computer having a cover having an introduction slot for receiving magnetic cards and an exit slot, a device for reading from and writing on, magnetic cards having one non-magnetizable face and one magnetizable face, said device comprising:

two parallel guides disposed between said introduction slot and said exit slot, said guides being receptive of the cards for defining a path therealong to be traversed by said cards with the faces of each card running between said guides;

two support plates for said guides disposed perpendicular thereto, the lateral edges of the cards running along the plates;

writing and reading means rigidly mounted on one of the support plates in correspondence with a predetermined portion of said guides;

an entrainment belt mounted to contact the non-magnetizable face of the card as it passes through said guides; and

pressure-rollers mounted to contact the magnetizable face of the card for cooperating with said belt during entrainment of a card.

3,947,664

HIGHLY ACCURATE ODOMETER

Percy T. Cox, and Herbert A. Rundell, both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Jan. 2, 1974, Ser. No. 430,135

Int. Cl.² G06M *3/14*

U.S. Cl. 235—92 PL **3 Claims**

1. An odometer for accurately measuring long linear lengths, comprising in combination

a wheel driving an electric pulse generator,

said pulse generator producing a first predetermined number of pulses for each predetermined amount of said wheel rotation,

said wheel rotation measuring a predetermined increment of said linear length depending upon the circumference thereof,

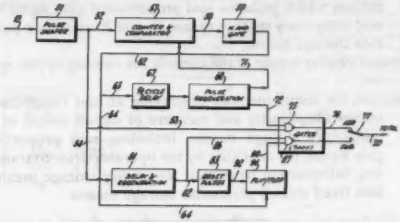
a pulse shaper,

a total pulse counter for indicating said long linear length,

a subtotal pulse counter for determining when a second predetermined number of pulses has been reached,

means for comparing a preset count representing said second predetermined number of pulses with said subtotal pulse counter,

a NAND gate for passing a pulse when said preset count has been reached by said subtotal counter,



a selector switch in the input of said total pulse counter,

an add channel for introducing an extra pulse, comprising

a time-delay circuit for delaying said NAND gate pulse at least the width of one of said shaped pulses,

a pulse regenerator, and

an OR gate for passing said total number of shaped pulses in addition to said regenerated pulse to an add side of said selector switch, and a subtract channel for removing a pulse, comprising

a delay and regeneration means connected to the output of said pulse shaper,

an inhibit signal flip-flop having an input connected to receive said NAND gate pulse, and

an inhibit OR gate for passing said delay and regeneration means output to a subtract side of said selector switch, except when said inhibit signal is present.

3,947,665

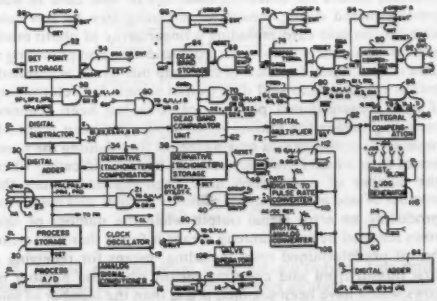
CONTROL SYSTEM AND METHOD

R. Gerald Hundley, Duxbury, Mass., assignor to VSI Energy Systems International, Inc., Philadelphia, Pa.

Filed Apr. 22, 1974, Ser. No. 462,654

Int. Cl.² G06F *3/04, 15/46*

U.S. Cl. 235—150.1 **31 Claims**



1. In a digital process controller having feedback means for producing a process signal representative of a process variable to be controlled, a reference signal, means responsive to said

process and reference signals for deriving an error signal in response to the difference therebetween, controlling circuit means including multiplier means and having an output signal responsive to said error signal for control of the process variable, the improvement comprising:

a console

fixed circuit parameter multiple-bit erasable storage means at the console for storing controlling circuit parameters including a proportional gain signal to establish the amount by which said error signal is multiplied by said multiplier means,

a keyboard with key members actuatable by an operator,

multiple-bit temporary storage means at the console responsive to actuation of key members for temporarily storing signals for establishing the fixed circuit parameters including the proportional gain signal,

means under control of said keyboard for transferring information which includes said proportional gain signal from said temporary storage means to said fixed circuit parameter storage means,

visual display means at the console for viewing by the operator,

means for simultaneously displaying at said visual display means the identity and measure of signals stored in said temporary storage means, including said proportional gain signal, for checking by the operator prior to transferring information from said temporary storage means to said fixed circuit parameter storage means.

3,947,666

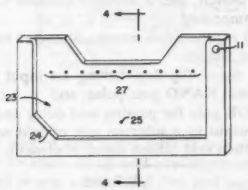
CARD READER

Robert D. Carlson, Danville, Calif., assignor to Drake Manufacturing Company, Harwood, Ill.

Filed Aug. 9, 1974, Ser. No. 496,356

Int. Cl.² G06K 7/10, 19/04

U.S. Cl. 235—61.11 E **5 Claims**



1. Apparatus for reading a card which has a plurality of data bits located in a predetermined plurality of rows and a predetermined plurality of columns, wherein there is at least one bit in each row and which comprises: receiving means having a slot of a predetermined depth into which said card may be inserted; means for detecting insertion of said card to said predetermined depth; means for scanning row by row said data bits on said card including a linear array of photo emitters, as said card is withdrawn from said slot, and providing a data output signal for each of said data bits which is scanned; means responsive to said data output signals for determining if said predetermined plurality of rows has been scanned including means for sensing when a row has been scanned; means responsive to said sensing means for counting the number of rows which have been scanned and for indicating when the number of rows which have been counted equals the number of said predetermined plurality of rows, and means for producing an error signal output when the number of said rows scanned by said scanning means is fewer than said number of predetermined rows including, means for receiving a first output from said counting means when the number of rows which have been scanned is less than the number of said predetermined plurality of rows, means for producing a second output when all of said data bits on said card have been withdrawn past said scanning means, and gating means responsive to said first and second couputs for producing said error signal output.

3,947,667

CIRCUIT FOR DETERMINING TOOL AXIS OFFSET COMPENSATION

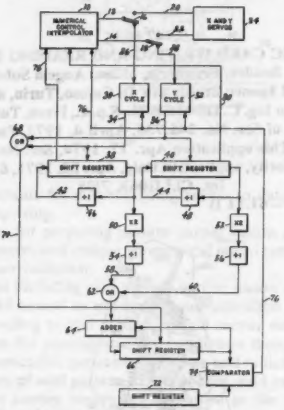
Peter Robert Parker, Biggleswade, England, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed June 19, 1974, Ser. No. 480,688

Claims priority, application United Kingdom, June 25, 1973, 30090/73

Int. Cl.² G06F 15/46

U.S. Cl. 235—151.11 **1 Claim**



1. An apparatus for use with a numerical control having a pulse generator for generating trains of X and Y pulses having rates proportional to displacement along respective X and Y axes of motion, said apparatus being operative during a preliminary execution of a program to produce X and Y tool offset signals representing component values along each axis of motion for a desired tool radius offset, the apparatus comprising:

a. cycle control means responsive to the trains of X and Y pulses for producing trains of X and Y clock signals, respectively;

b. X and Y register and one-bit adder loops responsive to corresponding X and Y clock signals for incrementing by one X and Y first signals contained in the registers in response to the clock pulses, said X first signal having a magnitude proportional to the number of X pulses and representing the Y tool offset signal and said Y first signal having a magnitude proportional to the number of Y pulses and representing the X tool offset signal;

c. X and Y multiplier means responsive to the X and Y first signals respectively for multiplying the first signals by two to produce X and Y product signals;

d. X and Y one-bit adder means responsive to the multiplying means for adding one to the X and Y product signals to produce X and Y second signals representing the square of the X and Y first signals respectively;

e. adder and storage means responsive to the onebit adder means for summing the X and Y second signals;

f. a storage register for storing a reference signal representing the square of the desired tool radius offset; and

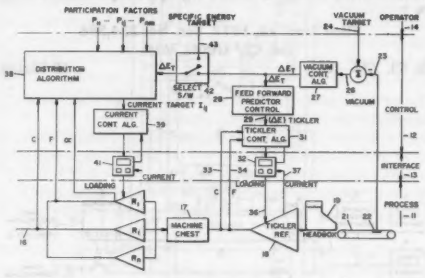
g. a comparator circuit having inputs responsive to the adder and storage means and outputs connected to the cycle control and the pulse generator for producing a stop signal in response to the sum of the second signals being equal to or greater than the reference signal, said stop signal terminating the operation of the cycle control

means and the pulse generator whereby the magnitude of the X and Y first signals at the time of occurrence of the stop signals represents the magnitude of the Y and X tool offset signals respectively.

3,947,668
METHOD AND APPARATUS FOR CONTROLLING PULP REFINERS

Al Al-Shaikh, Sunnyvale, and Erik B. Dahlin, Saratoga, both of Calif., assignors to Measurex Corporation, Cupertino, Calif.

Continuation-in-part of Ser. No. 299,225, Oct. 20, 1972, abandoned. This application July 20, 1973, Ser. No. 381,170
Int. Cl.² B02C *25/00*; G06F *15/46*
U.S. Cl. 235—151.12 **6 Claims**



1. A control system for controlling the quality of the output stock of a group of pulp refiners which include a plurality of base refiners and tickler refiner means the output stock of the tickler refiner means being used to manufacture sheet material and where the coupling between the base refiners and the tickler refiner means includes a significant time delay said system comprising: first control means associated with said tickler refiner means and responsive to a first input control signal for loading said tickler refiner means in accordance with such signal; second control means associated with said base refiners and responsive to second input control signal means for loading said base refiners in accordance with such signal means; means for sensing the quality of the output stock from said tickler refiner means and comparing such quality to a target value to provide an error signal; means associated with said base refiners and responsive to said error signal for causing said second output control signal means to load said base refiners to fully compensate for said error signal; feedforward means responsive to said error signal for causing said first output control signal to change from an optimum operating value to initially load said tickler refiner means to fully compensate for said error signal and thereafter gradually change said loading back to said optimum value in accordance with said time delay.

3,947,669
VOTING MACHINE

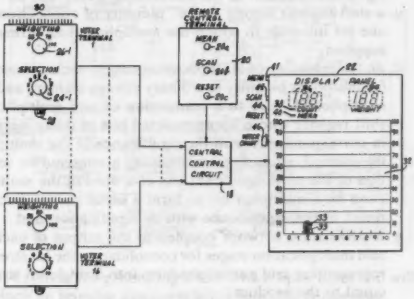
William W. Simmons, Greenwich, and James A. Marquis, Danbury, both of Conn., assignors to Applied Futures, Inc., Greenwich, Conn.

Filed Dec. 30, 1974, Ser. No. 537,408
Int. Cl.² G06F *15/20*; G07C *13/00*
U.S. Cl. 235—156 **13 Claims**

1. A voting machine having a voter terminal for each voter, a central control and a display electrically connected to each other, comprising;

means in each voter terminal for establishing therein an electrical circuit corresponding to the voter selection of an alternative answer to a question and for additionally establishing therein an electrical circuit corresponding to the voter selection of the voter degree of confidence in the selected alternative answer;

means in the central control for deriving a digital electrical signal corresponding to each established electrical circuit and for combining the derived digital electrical signals to thereby derive a digital denominator signal corresponding to the cumulative confidence of all voters in all alternative answers selected thereby and for additionally deriving, for each alternative answer, a digital numerator signal corresponding to the cumulative degree of confidence of all voters in the alternative answer;



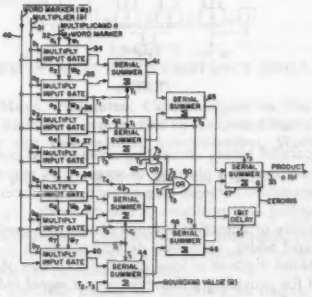
means in the display for visually-displaying, for each alternative answer, an indication, on a scale of a selected radix, of the ratio of the corresponding numerator digital signal and said signal denominator signal, thereby displaying an indication reflecting both the selection of alternative answers by the voters and the degree of confidence of the voters in the selected alternative answers; and

wherein the central control includes means for combining selected ones of said digital signals to derive thereby an electrical signal corresponding to a selected weighted means of the displayed ratio indications, and the display includes means for displaying an indication of the last recited electrical signal.

3,947,670
SIGNED MULTIPLICATION LOGIC

John M. Irwin, Clay, and Noble R. Powell, Syracuse, both of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Nov. 22, 1974, Ser. No. 526,373
Int. Cl.² G06F *7/39*
U.S. Cl. 235—164 **15 Claims**



1. Signed multiplication logic for multiplying two serial binary numbers to obtain a serial binary product, the multiplicand containing magnitude and sign information in two's complement notation, the multiplier containing magnitude information and the product containing magnitude and sign

information in two's complement notation, said multiplier, multiplicand and product bit streams occurring serially at equal word rates with the least significant bit first in time, said multiplication logic comprising:

a. a bus to which the multiplier bit stream is supplied in words of an "*n*" plurality of bits,

b. an "*n*" plurality of binary storage elements coupled to said bus for storing the successive words of said multiplier bit stream, each storage element selecting a bit a predetermined significance from each word of said multiplier bit stream and storing said selected bit until a bit of like significance occurs in the succeeding word,

c. a shift register having an "*n*" plurality of connections at one bit intervals to which the multiplicand bit stream is supplied,

d. an "*n*" plurality of multiplication stages, each connected for multiplier bit entry to a binary storage element and for multiplicand entry to a connection of said multiplicand shift register whose accummulated bits of delay increase in correspondence with the significance of the multiplier bit entered, each stage multiplying a consecutive selection of the most significant bits of a word of the multiplicand by a multiplier bit to form a serial partial product timed in correspondence with its significance, and

e. a summation network coupled to the output of each of said multiplication stages for consolidating the bit streams representing said partial products into a single bit stream equal to the product.

3,947,671

BINARY PARALLEL COMPUTING ARRANGEMENT FOR ADDITIONS OR SUBTRACTIONS

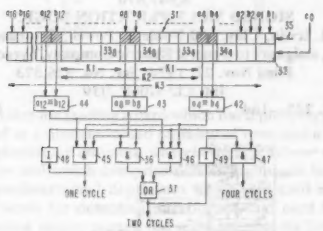
Hellmuth Roland Geng, Herrenberg; Johann Hajdu, and Günter Knauft, both of Boeblingen, all of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 23, 1975, Ser. No. 589,091

Claims priority, application Germany, July 6, 1974, 2432450

Int. Cl.² G06F 7/50

U.S. Cl. 235—175 **8 Claims**



1. A parallel binary computing arrangement comprising:

an adder having a plurality of stages with sequential carry propagation between stages, each stage receiving corresponding digit positions of two operands,

a plurality of detection circuits distributed over the stages of said adder, each said detection circuit receiving the operand digits of at least one digit position of each operand for providing a detector output signal indicating the beginning or the end of a carry ripple by testing the condition "both operand digits 0 or both operand digits 1",

a coder connected and responsive to the output signals of said detection circuits for providing one of a plurality of group indicating signals, each of which corresponds to a predetermined distance of possible carry ripples between digit positions,

a clock including pulse generating means for providing a repeatable sequence of a predetermined number of time pulses; and

clock modifying means, responsive to said group indicating signals from said coder for selectively skipping certain of said time pulses, whereby the operating time between the starting time of said clock sequence if limited to the duration of the carry ripple over the shortest digit position distance determined by said detection circuits.

3,947,672

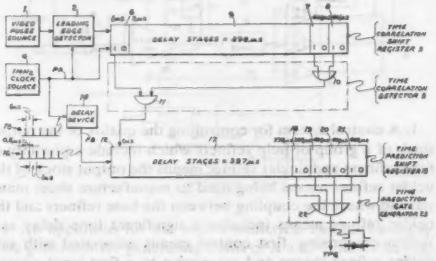
DIGITAL DELAY LINE CORRELATOR

Raymond E. Harrison, West Caldwell; Marvin L. Kiss, Nutley, and Douglas E. Ott, Newfoundland, all of N.J., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Mar. 14, 1972, Ser. No. 234,596

Int. Cl.² G06G 7/04

U.S. Cl. 235—181 **19 Claims**



1. An arrangement to detect in a stream of input pulses at least a first plurality of sequences of time spaced pulses, each of said first sequences having a different one of a plurality of pulse repetition intervals disposed within at least one given pulse repetition interval range comprising:

a first source of said stream of input pulses;

a first means coupled to said source to store said stream of input pulses in time such that the time relationship of each of said input pulses relative to each other as received from said source is maintained, said first means having N groups of *n* outputs disposed at different spaced time positions relative to each other such that the time difference between certain ones of said *n* outputs of adjacent ones of said N groups of *n* outputs define said plurality of pulse repetition intervals and the time difference between certain ones of said *n* outputs of at least one of said N groups of *n* outputs defines said given pulse repetition interval range, where N is an integer greater than one and *n* is an integer greater than zero;

second means coupled to said N groups of *n* outputs to provide an output pulse when said time spaced pulses of said first plurality of sequences of time spaced pulses are simultaneously present at certain ones of said *n* outputs of a given number of said N groups of *n* outputs; and

third means coupled to said second means responsive to said output pulse to produce a gate pulse defining the time at which the next pulse of each of said first plurality of sequences should arrive from said first source.

3,947,673

APPARATUS FOR COMPARING TWO BINARY SIGNALS

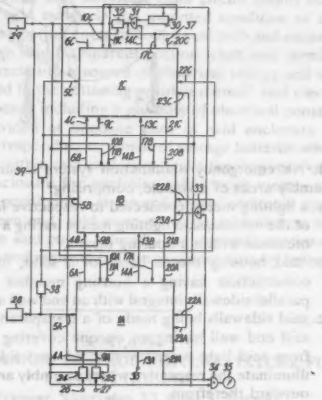
James Redmon Jordan, Dunfermline, and Robert Graham Kelly, Balerno, both of Scotland, assignors to National Research Development Corporation, London, England

Filed Aug. 23, 1974, Ser. No. 499,990

Claims priority, application United Kingdom, Aug. 24, 1973, 40266/73

Int. Cl.² G06F 7/02, 15/34

U.S. Cl. 235—181 8 Claims



1. An apparatus for comparing two binary signals, comprising:

a binary word register comprising a plurality of binary shift registers each having a serial input and each comprising a set of serially connected stages, said shift registers being connected in a serial chain so that the stages of all said shift registers form a sequence defining the sequence of digit positions of a binary word stored in said binary word register;

means for operating said binary word register so that it stores temporarily, in respect of each of a series of regularly recurrent instants, a binary word the digits of which correspond in sequence to the states of a first one of said two binary signals at times earlier by successively greater amounts than the relevant one of said series of instants, said means comprising means for operating said shift registers individually so that those digits of the binary word temporarily stored in the first of said shift registers in said chain can change state for each of the instants of said series while those digits of the binary word temporarily stored in any other of said shift registers can change state only for each Nth one of the instants for which those digits of the binary word temporarily stored in the preceding one of said shift registers in said chain can change state, N being a small integer;

means for effecting a sequence of comparison operations in each of which the state of the second of said two binary signals is compared with each of the digits of the binary word temporarily stored in said binary word register;

means for counting the results of the comparisons separately for each of said digit positions; and

signalling means for generating a signal in response to the reaching of a given value by the count for any one of said digit positions, said signalling means comprising means causing the signal to have a form indicating for which of said digit positions the count first reached said given value.

3,947,674

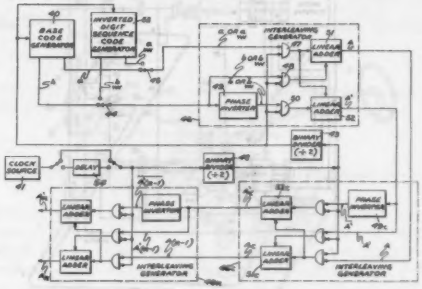
CODE GENERATOR TO PRODUCE PERMUTATIONS OF CODE MATES

Frank S. Gutleber, Wayne, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Sept. 28, 1967, Ser. No. 671,382

Int. Cl.² G06G 7/19; H03K 13/02

U.S. Cl. 235—181 10 Claims



1. A system for generating codes which upon detection will produce an impulse autocorrelation function comprising:

first means to produce a first code and a second code each having a plurality of digit time slots and cooperating autocorrelation functions to produce upon detection of said first and second codes said impulse autocorrelation function including an impulse output at a given time and a zero output at all oother times, each of said digit time slots having a given period;

second means to produce a control signal having a period equal to said given period;

at least one third means coupled to said first and second means responsive to said control signal to produce a first output code including the digit time slots of one of said first and second codes interleaved with the digit time slots of the other of said first and second codes; and

at least one fourth means coupled to said first and second means responsive to said control signal to produce a second output code including the digit time slots of one of said first code and the complement of said second code interleaved with the digit time slots of the other of said first code and the complement of said second code;

said first and second output codes having cooperating autocorrelation functions to produce upon detection of said first and second output codes said impulse autocorrelation function.

3,947,675

COMPUTER INTERACTIVE RESISTANCE SIMULATOR (CIRS)

Bobby G. Mayn, Pleasanton, Calif., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Jan. 3, 1975, Ser. No. 538,490

Int. Cl.² G06G 7/62

U.S. Cl. 235—184 10 Claims

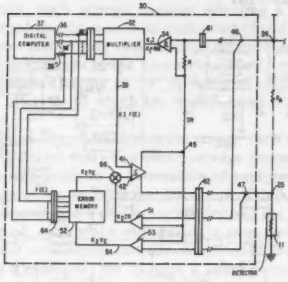
1. A combination of components for simulating the insertion of selected resistances of either positive or negative values in an electric circuit comprising:

a. a first amplifier means for providing an output voltage equal to a constant times a current in said circuit,

b. a multiplier operatively connected to said first amplifier for receiving said output therefrom,

c. means for providing a selected input of a manipulated value into said multiplier as a second input thereto whereby the output of said multiplier is the product of said selected input, a constant and said current, and

d. a second amplifier means, operatively connected to said multiplier to receive said output therefrom as a first input and operatively connected to receive an input representa-

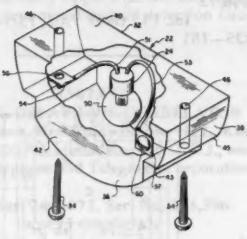


tive of the input to said first amplifier means as a second input, for providing an output of said combination equal to the product of a constant, said selected input and said current.

3,947,676
PORTABLE HEAD LAMP
Remeo A. Battilana, and Ann C. Battilana, both of Philadelphia, Pa., assignors to The Raymond Lee Organization, Inc., New York, N.Y., a part interest
Filed Nov. 1, 1974, Ser. No. 519,860
Int. Cl.² F21V *33/00*; A61B *1/06*
U.S. Cl. 240—6.4 W **1 Claim**

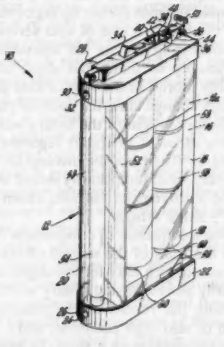
1. A portable head lamp, comprising
an adjustable first band removably mounted on the head of a wearer;
a light unit mounted on the first band for illuminating an area in front of the face of the wearer, said light unit comprising a lamp, a battery for energizing the lamp, a switch and a circuit electrically connecting the lamp, battery and switch in a manner whereby the switch selectively controls the energization of the lamp;
a substantially rigid second band pivotally affixed to the first band; and
magnifying means affixed to the second band in a manner whereby in selected positions of the second band said magnifying means is over the light unit and magnifies and directs illumination produced by the light unit, and in other positions of the second band said second band rests on the head of the wearer and said magnifying means is spaced from the light unit.

3,947,677
EMERGENCY ILLUMINATION
Leo D. Steinle, Dorrance, Kans. 67634
Filed Dec. 6, 1973, Ser. No. 422,262
Int. Cl.² B60Q *1/26*
U.S. Cl. 240—8.1 R **2 Claims**



1. An emergency illumination system mounted on wheel assembly areas of a vehicle, comprising:
a. a lighting means connected to respective fender sections of the vehicle, said lighting means having a light assembly mounted within a housing means,
b. said housing means being of a solid, molded, plastic construction having a housing member with upright, parallel sidewalls integral with an end wall and a top wall,
c. said sidewalls being made of a transparent material and said end wall having an opaque covering to allow light from said light assembly through said sidewalls only to illuminate the respective wheel assembly area and an area outward therefrom,
d. said end wall being opaque to direct light through said sidewalls,
e. said light assembly enclosed by the molded plastic construction of said housing means for durability, and
f. said fender section having a horizontally extended fender edge and said top wall secured against said fender edge.

3,947,678
FLUORESCENT LANTERN
Wing-Hing Herbert Tang, 326, Kwun Tong Road, Kwun Tong, Kowloon, Hong Kong
Filed Oct. 15, 1974, Ser. No. 514,792
Int. Cl.² F21L *3/00*
U.S. Cl. 240—11.4 R **18 Claims**



1. A fluorescent lantern comprising an at least partially transparent elongate enclosure having an open end; a cover removably mounted on said enclosure to cover the open end when mounted on said enclosure; reflector means extending along the length of said enclosure proximate the transparent

portion thereof; a fluorescent bulb extending along the length of said enclosure and disposed between said transparent portion and said reflector means whereby said reflector means enhances the amount of light transmitted through said transparent portion; electrical terminal means on said cover connectable to a source of direct voltage; a switch mounted on said cover and connected to said electrical terminal means; circuit means disposed within said enclosure for converting a direct voltage into an alternating voltage suitable for energizing said fluorescent bulb when applied across the latter; electrical contact means for completing and interrupting the electrical continuity between said switch and terminal means and said circuit means when said cover is respectively mounted and removed from said enclosure; said circuit means being controlled by said switch in the mounted condition of said cover to thereby permit energization of said bulb and emission of light through said transparent portion when said terminal means is connected to a source of electrical energy and said switch is moved to the actuating position thereof; said electrical terminal means including a plurality of electrical contacts internally provided at opposite ends of said enclosure for contacting corresponding terminals of storage batteries which are receivable within said enclosure; and a housing receivable within said enclosure for enclosing said circuit means, said housing being positionable at the end of said enclosure opposite to said open end; said contacts being mounted on said housing and on said cover, whereby the storage batteries are insertable into and removable from said enclosure by removal of said cover.

3,947,679

BOX- OR CHANNEL SHAPED LIGHTING FIXTURE FOR LIQUID COOLING

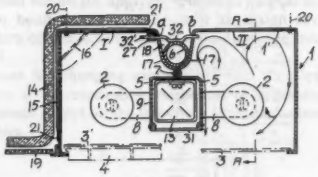
Karl Gunnar Frenger, Skovveien 33, Oslo 3, Norway

Filed Sept. 23, 1974, Ser. No. 508,607

Claims priority, application Sweden, Nov. 6, 1973, 73150526

Int. Cl.² F21V *29/00*

U.S. Cl. 240—47 **5 Claims**



1. A box or channel-shaped lighting fixture, having an internal cooling body for heat conducting contact with a straight liquid carrying cooling tube arranged in parallel with and between two lighting tubes or rows of lighting tubes, comprising; two metal plate channels (I, II) forming the lighting fixture (1) surrounding both lighting tubes (2), said channels being formed at their junction in the upper portion thereof with an upwardly open groove (18) for engaging the cooling tube directly below the roof (1') of the fixture; a downwardly extending, double partition wall (5) located between the lighting tubes, and contacting said channels to transfer heat thereto, said double separating wall (5) forming a downwardly open channel which is located below said groove (18) and wherein reactors of the lighting tubes (2) are mounted, which reactors are fixed in heat conducting manner within the channel.

3,947,680

STEERING RESPONSIVE CONTROL DEVICE FOR TURNING AUTOMOTIVE HEADLAMPS

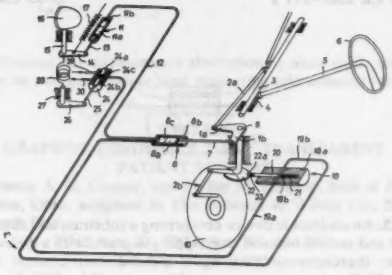
Jean Cadiou, Paris, France, assignor to Societe Anonyme Automobiles Citroen, Paris, France

Filed July 30, 1974, Ser. No. 493,735

Claims priority, application France, Aug. 6, 1973, 73.28676

Int. Cl.² B60Q *1/12*

U.S. Cl. 240—62.3 **5 Claims**



1. In a device for controlling the orientation of vehicle headlamps in response to movement of the vehicle steering mechanism, such device being of the type including a primary hydraulic circuit having liquid therein; a hydraulic transmitter mechanically connected to said steering mechanism and hydraulically communicating with said primary hydraulic circuit to pressurize said liquid therein in response to movement of said steering mechanism; a hydraulic receiver mechanically connected to said headlamps and hydraulically communicating with said primary hydraulic circuit to move said headlamps in response to pressurizing of said liquid; and means for compensating for volume changes of said liquid due to temperature variations thereof; the improvement wherein said compensating means comprises:

an auxiliary distributor mechanically connected to said headlamps and having an element movable in response to movement of said headlamps;

a correcting hydraulic circuit hydraulically communicating said auxiliary distributor with said primary hydraulic circuit;

hydraulic liquid supply means for supplying additional liquid to said correcting hydraulic circuit upon movement of said element of said auxiliary distributor in a first direction;

hydraulic liquid exhaust means for exhausting liquid from said correcting hydraulic circuit upon movement of said element of said auxiliary distributor in a second direction; and

means, responsive to movement of said steering mechanism, for allowing communication between said correcting hydraulic circuit and said primary hydraulic circuit when said steering mechanism is in a straight-ahead driving position, such that liquid will be supplied to and exhausted from said primary hydraulic circuit in response to movement of said element of said auxiliary distributor, and for interrupting communication between said correcting hydraulic circuit and said primary hydraulic circuit when said steering mechanism is in any position other than said straight-ahead driving position;

whereby movement of said element of said auxiliary distributor will supply additional liquid to or exhaust excess liquid from said primary hudraulic circuit only when said steering mechanism is in said straight-ahead driving position and only as a result of volume change due to temperature variation of said liquid in said primary hydraulic circuit.

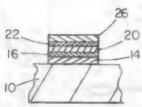
3,947,681
ELECTRON TUNNELING DEVICE

Ali Javan, Cambridge, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 389,970, Aug. 20, 1973 and Ser. No. 389,783, Aug. 20, 1973, Pat. No. 3,898,453, each is a continuations-in-part of Ser. No. 62,380, Aug. 10, 1970, Pat. No. 3,755,678. This application June 11, 1974, Ser. No. 478,236

Int. Cl.² H01J 39/12

U.S. Cl. 250—211 J **33 Claims**



25. An electronic device comprising a substrate and thereon first and second metallic overlapping deposits with a dielectric layer therebetween forming a metal-dielectric-metal type junction having a contact area of the order of 1 micron² or less and the dielectric layer thickness being less than about 10 Angstrom, said junction being conductive through quantum mechanical tunneling effects and having a non-linear current-voltage response characteristic, said dielectric layer having local quantized modes and means applying to such junction an alternating field of frequency in the region of the energy band between local quantized modes thereby to produce a response dependent upon the interaction of said applied field and said local quantized modes.

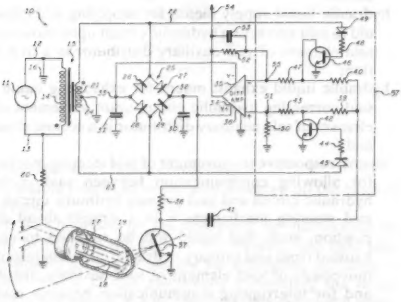
3,947,682
APPARATUS FOR MEASURING ANGULAR DISPLACEMENT

Clarence D. Mumme, Phoenix, Ariz., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 10, 1974, Ser. No. 531,265

Int. Cl.² G01D 5/34

U.S. Cl. 250—231 R **8 Claims**



1. Apparatus for measuring angular displacement of an object comprising:

light source means including a first electrode means and a second electrode means with a medium therebetween and in which, in response to a potential source applied across said first and second electrode means, an illumination occurs in the medium about whichever of the first or second electrode means is coupled to the more negative polarity of the potential source,

means for alternating the polarity of the potential source applied across said first and second electrode means,

photodetecting means for detecting the alternating illuminations about said first and second electrode means and generating output signals relative to the distance between the photodetecting means and said first electrode means and between the photodetecting means and said second electrode means,

means for mounting said light source means and said photodetecting means such that the distances between the photodetecting means and said first electrode means and between the photodetecting means and said second electrode means vary relative to the angular displacement of the object in a manner such that for any variation in distance between the photodetecting means and the first electrode means, there is a related variation in the distance between the photodetecting means and the second electrode means.

3,947,683
COMBINATION OF EPITHERMAL AND INELASTIC NEUTRON SCATTERING METHODS TO LOCATE COAL AND OIL SHALE ZONES

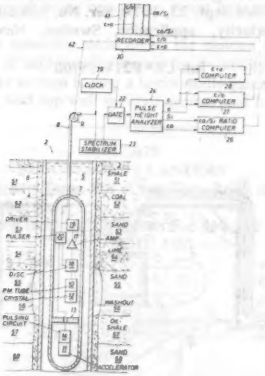
Ward Edward Schultz; Harry Davis Smith, Jr., and Philip France McKinlay, all of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 367,299, June 5, 1973, Pat. No. 3,849,646. This application Feb. 15, 1974, Ser. No. 442,932

The portion of the term of this patent subsequent to Nov. 19, 1991, has been disclaimed.

Int. Cl.² G01T 5/00

U.S. Cl. 250—270 **10 Claims**



1. A method for locating and determining the quality of coal beds traversed by a well borehole comprising the steps of:

passing a well tool having a pulsed source of fast neutrons and radiation detector through a well bore;

repetitively irradiating the earth formations in the vicinity of the well bore with relatively short duration bursts of fast neutrons;

detecting, during said neutron bursts, gamma rays resulting from the inelastic scattering of fast neutrons by carbon and oxygen, in earth formations in the vicinity of the well bore and generating signals representative thereof;

generating signal representative of the carbon/oxygen ratio of inelastic gamma rays in earth formations in the vicinity of the well bore;

determining the location and the quality of said coal beds by comparing said carbon/oxygen ratio signal with a predetermined relationship of said carbon/oxygen ratio signal as a function of the BTU content of coal.

3,947,684
SCINTIGRAM DISPLAY APPARATUS WITH MULTILEVEL ANALYSIS AND TWO-DIMENSIONAL INTERPOLATION

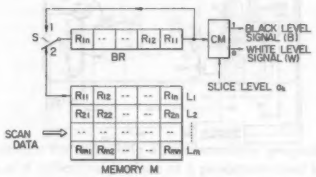
Jun Ikebe, Tokyo, Japan, and Oscar Akio Nawa, Sao Paulo, Brazil, assignors to Hitachi Medical Corporation, Tokyo, Japan

Filed Sept. 27, 1974, Ser. No. 510,055

Claims priority, application Japan, Sept. 28, 1973, 48-108362; Mar. 28, 1974, 49-33976; Mar. 28, 1974, 49-33977

Int. Cl.² G01T 1/20

U.S. Cl. 250—369 **14 Claims**



1. A scintigram display apparatus employing a television display means having a screen, a beam intensity modulator and a sweep signal, comprising:

a. scintillation scanning means for two-dimensionally scanning over an object emitting gamma-rays and measuring the input gamma-rays for producing a two-dimensional array of output signals correlated to the two-dimensional array of gamma-radiation from the object:

b. memory means for storing the two-dimensional array of said output signals from said scintillation scanning means;

c. means for reading out the data coresponding to one scan line of the two-dimensional array from said memory means;

d. comparator circuit means for comparing each datum from said reading means, in synchronism with the television sweep signal, with a preset slice level and therby generating a binary signal as the result of such comparison;

e. circuit means for applying said binary signal as the television beam intensity modulator to assign two different colors on the screen corresponding to the binary signal; and

f. means for changing sequentially said slice level to produce a corresponding sequence of silhouettes of the scanned object on the television screen in at least said two colors.

3,947,685
METHOD AND ARRANGEMENT FOR DETERMINING NITRIC OXIDE CONCENTRATION

Helmut Meinel, Stuttgart, Germany, assignor to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.v., Bonn, Germany

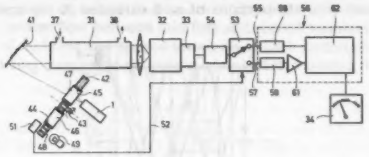
Filed Apr. 3, 1974, Ser. No. 457,643

Claims priority, application Germany, Feb. 15, 1974, 2407133

Int. Cl.² G01J 1/42

U.S. Cl. 250—373 **42 Claims**

1. A method of determining the concentration of nitric oxide (NO) in a gas mixture of unknown composition, particularly exhaust gas, comprising the steps of pumping air through a hollow-cathode tube and keeping the air pressure therein subatmospheric; continuously producing in the tube, from the nitrogen and oxegen in the air passing therethrough, excited nitric oxide molecules which emit radiation consisting of a plurality of discrete rotational spectral lines, by applying a potential difference across the anode and cathode of the tube and operating the tube at a current having an order of magnitude of about 1 milliampere; directing a beam of such radiation through said gas mixture so that such radiation becomes



attentuated due to resonance absorption by nitric oxide molecules in said gas mixture; and measuring said attentuation.

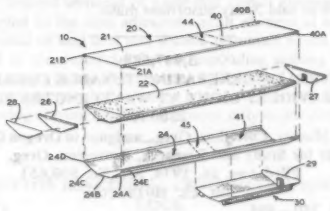
3,947,686
GRAPHITE COMPOSITE X-RAY TRANSPARENT PATIENT SUPPORT

Adrianus A. G. Cooper, and Phillip M. Leopold, both of Alliance, Ohio, assignors to The Babcock & Wilcox Co., New York, N.Y.

Filed Apr. 25, 1974, Ser. No. 464,079

Int. Cl.² G03B 41/16

U.S. Cl. 250—439 **7 Claims**



1. An X-ray machine system having an X-ray emitter, a film cassette and a patient support having a longitudinal axis and end portions disposed between the emitter and the film cassette wherein the patient support comprises, a supporting platform having a shell, a portion of said shell being fabricated from a plurality of layers of generally radiolucent unidirectional graphite fiber epoxy composite, each layer having a longitudinal axis, the graphite fibers in each layer being oriented parallel to the longitudinal axis of the layer and the composite layers being oriented parallel to the longitudinal axis of the support, an inner core fabricated from a generally radiolucent polyurethane foam, said inner core being joined to said composite layers by a generally radiolucent bonding epoxy, means for closing the end portions of said shell, and means for attaching the support to a stand.

3,947,687
COLLIMATED X-RAY SOURCE FOR X-RAY LITHOGRAPHIC SYSTEM

Thomas E. Fenstermacher, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 23, 1974, Ser. No. 517,341

Int. Cl.² G01N 21/34

U.S. Cl. 250—492 A **1 Claim**

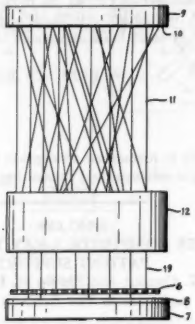
1. In an X-ray lithographic system, apparatus for projecting patterned X-ray illumination onto a photo resist coated substrate member comprising

an X-ray source having an extended X-ray emission area,

an X-ray collimater adapted to collimate X-rays emitted from said X-ray source, and

an X-ray adsorbant mask having patterned X-ray transmitting apertures therein positioned proximate to said sub-

strate member and in intercepting relationship with X-ray illumination transmitted through said collimator said X-ray source being adapted to provide X-ray emission from only discrete portions of said extended X-ray emission



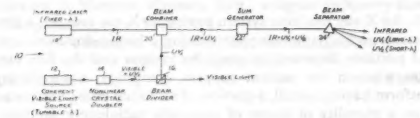
area, each said discrete X-ray emitting portion being substantially coextensive in area to and aligned in register with a corresponding patterned X-ray transmitting aperture in said X-ray adsorbant mask.

3,947,688

METHOD OF GENERATING TUNABLE COHERENT ULTRAVIOLET LIGHT AT WAVELENGTHS BELOW 2500 A

Gail A. Massey, Cornelius, Oreg., assignor to Oregon Graduate Center for Study and Research, Beaverton, Oreg.

Filed Aug. 26, 1974, Ser. No. 500,651
Int. Cl.² H01S *3/00*
U.S. Cl. 250—495 **12 Claims**



1. The method of generating tunable, coherent optical radiation having a short wavelength ultraviolet component in the range of about 2000 to about 2500 A which comprises sum frequency phase matching in a crystal having second order nonlinear polarisability, coherent infrared radiation having a wavelength of about 1060 nm with coherent ultraviolet radiation consisting of the second harmonic of the coherent output from a wavelength-tunable source of visible-wavelength radiation.

3,947,689

AUTOMATIC SYSTEM FOR PRECISE COLLIMATION OF RADIATION

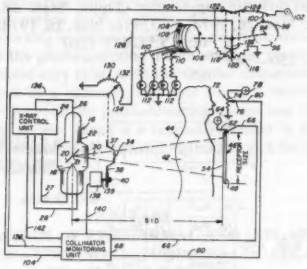
Howard G. Wagner, New Canaan, Conn., assignor to The Machlett Laboratories, Inc., Stamford, Conn.

Division of Ser. No. 354,826, April 26, 1973, Pat. No. 3,863,073. This application May 6, 1974, Ser. No. 467,411
Int. Cl.² G21F *5/04*
U.S. Cl. 250—512 **17 Claims**

1. A radiographic system comprising:

means for directing an X-ray beam from a source through an adjustable shutter aperture and onto an image receptor located at a predetermined distance from the source; and

automatic means for adjusting the shutter aperture to provide the X-ray beam with a cross-sectional size conforming to the image receptor at the predetermined distance from the source, the automatic means including source-to-image distance sensing means for producing an output electrical signal corresponding to the source-to-image receptor distance, and shutter aperture size sensing



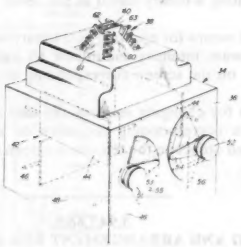
means connected to the outpput of the source-to-image distance sensing means for modifying said signal in accordance with a defining dimension of the actual shutter aperture size and producing an associated field size electrical signal corresponding to the actual radiation field size at the plane of the image receptor.

3,947,690

RADIATION LIMITING MEANS

Leonard F. Peyser, Briarcliff Manor, N.Y., assignor to The Machlett Laboratories, Inc., Stamford, Conn.

Filed July 11, 1974, Ser. No. 487,501
Int. Cl.² G03B *41/16*
U.S. Cl. 250—513 **10 Claims**



1. An off-focus X-radiation limiting device comprising:

a hollow frusto-pyramidal shutter having frusto-triangular walls made of X-radiation absorbent material and having pivotal means secured to the base portions thereof for permitting movement of the opposing end portions relative to the axial centerline of the structure to define a radiation limiting aperture;

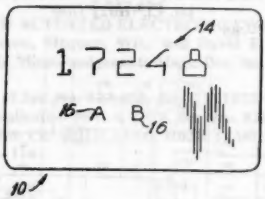
each of the walls being a frusto-triangular plate having respective pluralities of spaced teeth arcuately disposed on the sloped edges thereof and substantially concentric in the plane of the plate with the aligned base corner thereof for intermeshing with similarly disposed teeth on respective sloped edges of adjacent frusto-triangular walls of the shutter; and

means for controllably pivoting the walls relative to the axial centerline of the shutter to vary the size of the aperture.

3,947,691
OPTICAL EMBOSSING READER

Amnon Goldstein, Forest Hills, N.Y., assignor to Decicom Systems, Inc., Farmingdale, N.Y.

Continuation of Ser. No. 11,707, Feb. 16, 1970, abandoned. This application Dec. 26, 1973, Ser. No. 428,281
Int. Cl.² G02B 5/14
U.S. Cl. 250—566 4 Claims



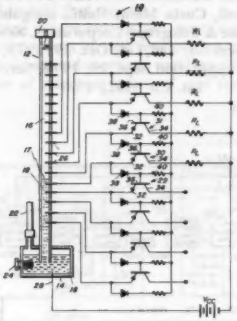
1. A device for detecting an embossment projecting from a portion of a reflective surface at a predetermined location on said surface comprising means for illuminating a region of said predetermined location including a first light transmitting fiber optic element having an illuminating end face; light sensing means for receiving light originating from said illuminating means reflected from said reflective surface including a second light transmitting fiber optic element having a sensing end face; and means for positioning said sensing means relative to said illuminating means and predetermined location for the limiting, by said portion of said reflective surface, of the quantity of such reflected light actually received by said sensing means if said portion projects beyond said surface, said positioning means positioning said reflective surface so that said illuminating end face and said sensing end face are both positioned spaced relative to said reflective surface a distance slightly greater than the projection of said embossed portion, and so that one of said illuminating or sensing end faces is positioned for facing relation to a region of said reflective surface on one side of said portion thereof, the other of said illuminating or sensing end faces being positioned in facing relation to said portion of said reflective surface or to a region of said reflective surface on a side of said portion substantially opposed to said one side thereof, so that light from said illuminating end face and reflected from said reflective surface is cut off from said sensing end face by an intervening embossment at said portion of said reflective surface, said sensing means producing first and second characteristic output signals in response to the quantity of light received thereby, said signals being representative respectively of the presence or absence of an embossment at said portion of said reflective surface.

3,947,692
DIGITAL TRANSDUCERS

Viron E. Payne, Merritt Island, Fla., assignor to Viron E. Payne, Inc., Merritt Island, Fla.

Filed Aug. 5, 1974, Ser. No. 494,751
Int. Cl.² G01F 23/22
U.S. Cl. 250—577 14 Claims

1. A digital transducer comprising:
a container;
two disparate materials in said container defining an interface therebetween, said interface being movable through said container responsive to a force applied to one of said materials;
a plurality of means spaced along said container for sensing said interface, each of said sensing means responding to the presence of one of said materials;
means coupled to all of said sensing means for electrically suppressing outputs from all of said sensing means responding to said one material except that one sensing means which responds to said one material and is nearest said interface, said output suppressing means comprising a plurality of active circuit elements, each having first and second terminals and another terminal for controlling current flow between said first and second terminals, one of said first and second terminals of each circuit element being coupled to the output of one of said sensing means,

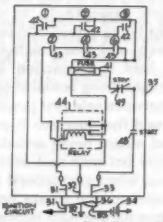


said control terminal of each said circuit element being coupled to the next adjacent circuit element at said one terminal of said first and second terminals which is coupled to the output of the corresponding sensing means; and means interposed between said control terminal and said one terminal of said next adjacent circuit element for allowing current flow therebetween only in one direction.

3,947,693
PUSH BUTTON ELECTRICAL COMBINATION IGNITION LOCK

Joel L. Eskenas, 44 Noel Ave., Brooklyn, N.Y. 11229

Filed June 11, 1974, Ser. No. 478,214
Int. Cl.² B62D 45/00
U.S. Cl. 307—10 AT 2 Claims



1. An electrical switching device connected to the ignition circuit of the motor of a vehicle which permits connection of power to the ignition circuit when the proper combination of switches mounted on the device are simultaneously manually operated and which disables the electrical circuit when one or more disabling switches are manually operated comprising
a switch box on which a plurality of push buttons are mounted for the individual operation of momentary normally open switches, with a first group of said switches wired together in series to a circuit for connecting a self-latching relay to a power supply circuit, and with
one or more of a second group of said switches wired in parallel together, and to a circuit joining the opposite poles of the power supply circuit, together with
an electrical fuse connected in series with the power supply line leading to all the switches of the second group and to one of the switches of the first group, such that operation

of any of the parallel wired switches will cause the fuse to blow,

said relay having a normally open contactor that joins the ignition circuit of the motor through said fuse to the power supply when the relay is in the energized state.

3,947,694

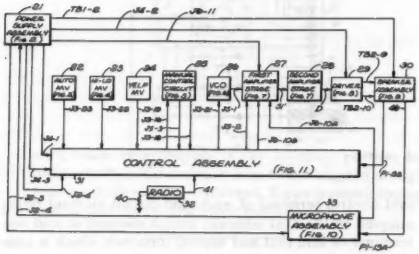
SOUND COMMUNICATION SYSTEM

Gordon S. Carroll, Costa Mesa, Calif., assignor to International Telephone & Telegraph Corporation, New York, N.Y.

Division of Ser. No. 410,776, Oct. 29, 1973, Pat. No. 3,873,980. This application Sept. 25, 1974, Ser. No. 509,294

Int. Cl.² H02J *4/00*

U.S. Cl. 307—11 **9 Claims**



1. In a sound communication system, the combination comprising: a common output lead; at least first and second signal sources with respective first and second output leads connected therefrom, the sources being constructed in a manner to produce first and second different output signals on the respective first and second output leads thereof; and selectively operable means for connecting either one of the first and second output leads to said common output lead while disconnecting the other of the first and second leads therefrom, said selectively operable means including first and second junctions connected from the first and second leads, respectively, first and second means connected from said first and second junctions, respectively, to said common output lead, said first means being actuable to produce effectively an open circuit between said first junction and said common output lead when said first junction is short circuited to ground, said first means being actuable to produce effectively a conductive path between said first junction and the common output lead when said first junction is not short circuited to ground, said second means being actuable to produce effectively an open circuit between said second junction and the common output lead when said second junction is short circuited to ground, said second means being actuable to produce effectively a conductive path between said second junction and the common output lead when said second junction is not short circuited to ground, said first means and said second means including first and second silicon-controlled rectifiers, respectively, having first and second anodes, respectively, first and second cathodes, respectively, and first and second gates, respectively, third means connecting said first junction to said first anode, fourth means connecting said second junction to said second anode, first and second double-pole, double-throw, momentary contact switch means including first and second normally closed switches, respectively, and first and second normally open switches, respectively, ganged together in a manner such that each normally open switch breaks before the normally closed switch ganged therewith breaks, said first and second normally closed switches being connected from said first and second cathodes, respectively, to ground, a common input lead, said first and second normally open switches being connected in parallel between an approximately constant potential conductor and said common input lead, and fifth and sixth means connecting said common input lead to said first and second gates, respectively.

3,947,695

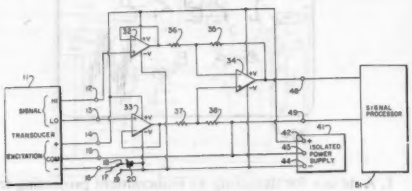
SIGNAL CONDITIONER FRONT-END

Philip J. Silvia, Newton, Mass., assignor to The United States of America as represented by the Secretary of the Department of Transportation, Washington, D.C.

Filed Oct. 21, 1974, Ser. No. 516,448

Int. Cl.² H02J *1/00*

U.S. Cl. 307—85 **1 Claim**



1. A signal conditioner front-end comprising:

a differential input inverting amplifier having input terminals for transducer SIGNAL HI and SIGNAL LO, ±15 VDC, −15 VDC, and COMMON; and output terminals for SIGNAL OUTPUT and COMMON:

first, second, and third operational amplifiers each having terminals for inverting and noninverting inputs, +15 VDC, −15 VDC and output;

the ±15 VDC terminal of each of said operational amplifiers connected to the +15 VDC input terminals of said differential amplifier,

the −15 VDC terminal of each of said operational amplifiers connected to the −15 VDC input terminal of said differential amplifier,

the output terminal is connected to the inverting input terminal of each of said first and second operational amplifiers; and

the SIGNAL HI input terminal of said differential amplifier is connected to the noninverting input terminal of said first operational amplifier,

the output terminal of said third operational amplifier is connected to the SIGNAL OUTPUT terminal of said differential amplifier,

a first resistive divider comprising first and second series connected matched resistors connected between the output terminals of said first and third operational amplifiers with the junction of said first and second resistors connected to the inverting input terminal of said third operational amplifier;

a second resistive divider comprising third and fourth series connected matched resistors connected between the output terminal of said second operational amplifier and the COMMON input terminal of said differential amplifier with the junction of said third and fourth resistors connected to the noninverting input terminal of said third operational amplifier;

an excitation voltage selector circuit comprising output terminals for + EXCITATION, − EXCITATION, and COMMON;

the +15 VDC input terminal of said differential amplifier is connected to the + EXCITATION output terminal of said selector circuit,

the COMMON input terminal of said differential amplifier is connected to the COMMON output terminal of said selector circuit,

said excitation voltage selector circuit further including switching means having a normally open contact terminal, a normally closed contact terminal and a wiper terminal,

the wiper terminal of said switching means is connected to the −EXCITATION output terminal of said selector circuit,

the normally closed contact terminal of said switching means is connected to the −15 VDC input terminal of said differential amplifier; and

a Zener diode connected between the normally closed and normally open contact terminals of said switching means.

3,947,696

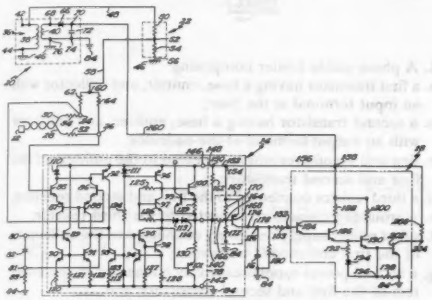
TOUCH ACTUATED ELECTRONIC SWITCH

Willis A. Larson, Mequon, Wis., and David E. Colglazier, Minneapolis, Minn., assignors to Magic Dot, Inc., Minneapolis, Minn.

Continuation of Ser. No. 323,303, Jan. 12, 1973, abandoned. This application Nov. 4, 1974, Ser. No. 520,716

Int. Cl.² H01H *35/00*; **H03K** *13/00*

U.S. Cl. 307—116 **82 Claims**



1. A touch actuated electronic switch, comprising in combination: differential amplifier means including first signal input means and second signal input means for receiving differential signals to be amplified and including signal output means for providing an amplified output signal related to an input signal received; a touch surface; means for providing an electrical connection between the touch surface and an input means to the differential amplifier means; means for receiving an alternating frequency voltage; means for providing an electrical connection between the receiving means and the differential amplifier means to provide a substantially equal common mode alternating voltage to the differential amplifier input means; integrating means; and means for providing an electrical connection between the output means of the differential amplifier means and the integrating means.

3,947,697

SYNCHRONIZING CIRCUIT INCLUDING TWO FLIP-FLOPS AND CIRCUIT MEANS TO PROTECT A SYNCHRONIZED SIGNAL FROM AN UNSTABLE STATE OF THE FLIP-FLOPS

Michel J. M. Archer, La Celle St. Cloud; Henri-Claude L. Battut, Bougival; Robert R. C. Bonami, Meudon, and Herve J. P. M. Louboutin, Palaiseau, all of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Sept. 12, 1974, Ser. No. 505,294

Claims priority, application France, Sept. 28, 1973, 73.34751

Int. Cl.² H03K *19/08, 5/13, 1/17*

U.S. Cl. 307—208 **6 Claims**

1. An electronic synchronizing circuit employing two stable flip-flops to synchronize a data signal by a clock signal, said data signal having no fixed phase relation with said clock signal, ensuring the protection of a synchronized signal from an unstable state of said flip-flops comprising:

a first source of said data signal;

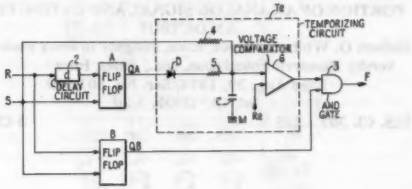
a second source of said clock signal;

two flip-flops each having at least an output, a clock input coupled to said second source and a data input;

at least one delay circuit having an input coupled to said first source and an output coupled to said data input of one of said two flip-flops to couple said data signal to said one of said two flip-flops after a first given time delay greater than a critical period of said two flip-flops;

said data input of the other of said two flip-flops being coupled to said first source;

a temporizing circuit having two inputs and an output, one of said two inputs of said temporizing circuit being coupled to said second source to receive said clock signal and the other of said two inputs of said temporizing circuit



being coupled to said output of said one of said two flip-flops to receive the output signal of said one of said flip-flops to provide a control signal having a variable delay with respect to said clock signal according to the phase relation between said clock signal and said data signal; and

a logic circuit having at least two inputs and an output, one of said two inputs of said logic circuit being coupled to said output of said temporizing circuit and the other of said two inputs of said logic circuit being coupled to said output of the other of said two flip-flops to provide a stable logical signal at said output of said logic circuit representing the output state of said other of said two flip-flops when said control signal is present.

3,947,698

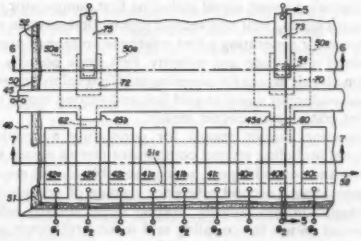
CHARGE COUPLED DEVICE MULTIPLEXER

Tom F. Cheek, Jr., and James B. Barton, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sept. 17, 1973, Ser. No. 398,285

Int. Cl.² H01L *27/10*; **H03K** *13/258*; **H04J** *3/10*

U.S. Cl. 307—221 D **20 Claims**



1. A charge coupled device analog signal multiplexer which comprises:

a. a charge coupled device shift register characterized by an array of sets of phase electrodes,

b. a plurality of charge packet injection input channels, each including means for providing charge packet inputs representative of time samples of respective analog signal inputs at an electrode location only in a pre-selected

number of said phase electrode sets less than the total number of said sets, the remainder of said sets defining isolation electrode sets disposed between said preselected electrode sets to provide isolation sets not connected to any signal input means,

c. a transfer gate common to all of said charge packet input means to admit said charge packets to said array,

d. clock means to apply shift voltages to said array to move said charge packets to the multiplexer output, and

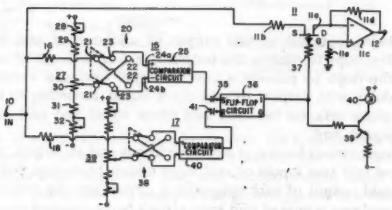
e. detector means to detect said charge packets at said output.

3,947,699

APPARATUS FOR SELECTING A PREDETERMINED PORTION OF AN ANALOG SIGNAL AND GATING IT TO AN OUTPUT

Delbert O. Whitmer, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Aug. 29, 1974, Ser. No. 501,509
Int. Cl.² H03K 5/20
U.S. Cl. 307—235 N **3 Claims**



1. Apparatus for selecting a predetermined portion of an input signal and for coupling said portion to an output while controlling the length of the selected portion comprising:

controlled gate circuit means having a first signal terminal connected to receive said input signal, a second signal terminal connected to said output for coupling a selected portion of said input signal thereto, and a control terminal;

initiation circuit means responsive to said input signal for generating a start signal including first comparator circuit means having first and second inputs, first settable circuit means for generating a first reference voltage of predetermined magnitude and polarity, first slope polarity selection circuit means for coupling said first reference voltage and said input signal to said first and second inputs of said first comparator circuit means;

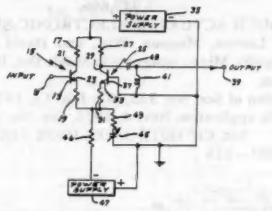
termination circuit means for generating a termination signal including second comparator circuit means having first and second inputs, second settable circuit means for generating a second reference voltage of predetermined magnitude and polarity, second slope polarity selection circuit means for coupling said second reference voltage and said input signal to said first and second inputs of said second comparator circuit means; and bistable circuit means responsive to said start signal and said termination signal and feeding the control terminal of said switch means for causing said switch means to conduct in response to said start signal and for causing said switch to open in response to said termination signal; whereby said start and termination signals may be set to occur independently either on a positive or a negative slope of said input signal and at a desired voltage level.

3,947,700

PHASE STABLE VARIABLE PHASE SLOPE LIMITER

Donald J. Hoft, Holliston, and Raoul E. Plutchak, Acton, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 29, 1974, Ser. No. 501,729
Int. Cl.² H03K 5/08
U.S. Cl. 307—237 **2 Claims**



1. A phase stable limiter comprising:

a. a first transistor having a base, emitter, and collector with an input terminal at the base;

b. a second transistor having a base, emitter, and collector with an output terminal at the collector;

c. first and second resistors connected to the emitters of the first and second transistors;

d. a third resistor connected to the first and second resistors;

e. a grounded capacitor connected to the third resistor;

f. a first power supply resistively connected to the collectors of the first and second transistors;

g. a second power supply resistively connected to the emitters of the first and second transistors; and

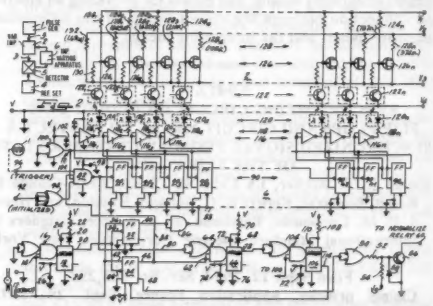
h. an inductor connected through a second capacitor between the collector and the base of the second transistor.

3,947,701

DIGITALLY CONTROLLED VARIABLE IMPEDANCE FOR CURRENT NORMALIZATION IN AN ELECTROLYTE TYPE PARTICLE SENSING ZONE

Dennis Russell, Jr., Downers Grove, Ill., assignor to Particle Data, Inc., Elmhurst, Ill.

Continuation of Ser. No. 380,369, July 18, 1973, abandoned. This application Jan. 13, 1975, Ser. No. 540,557
Int. Cl.² H03K 1/14; G01N 27/00
U.S. Cl. 307—264 **6 Claims**



1. A digitally controlled variable impedance comprising:

a pulse generator for generating a first train of electrical pulses of constant amplitude;

a variable impedance;

means for applying the pulse train to said variable impedance to cause generation of a second pulse train corresponding to the first pulse train, variation of the value of said impedance causing a corresponding variance in the amplitude of the pulses of the second pulse train;

means for setting a reference amplitude value at a detection point;

digital means operable in response to said first pulse train to vary said impedance; and

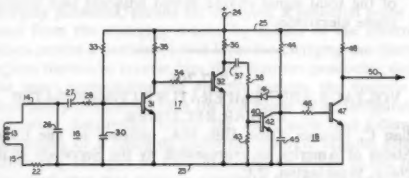
detecting means for detecting matching of the amplitude of said second pulse train with reference amplitude value and causing said digital means to stop varying said variable impedance.

3,947,702

FREQUENCY DOUBLING CIRCUIT FOR AUTOMOTIVE CONTROL SYSTEM

Ronald L. Syria, Utica, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Oct. 18, 1974, Ser. No. 516,309
Int. Cl.² H03K 17/00
U.S. Cl. 307—271 3 Claims



1. For use in an automotive vehicle having electronic circuitry utilizing a-c information signals occurring at a frequency related to the angular velocity of a vehicle wheel, a pulse-generating circuit comprising:

a sensor, positioned to provide frequency-indicating output signals varying in frequency as a function of variations in the angular velocity of the vehicle wheel;

a differentiating circuit, connected to receive the frequency-indicating output signals and to produce both a positive-going signal and a negative-going signal during each complete cycle of the sensor output signal;

a one-shot multivibrator circuit, including a first semiconductor switch having input, output and common connections and connected to be normally conducting, a capacitor coupled between the input and common connections of the first semiconductor switch such that upon discharge of said capacitor the switch is rendered non-conductive to generate a rectangular wave output pulse during the non-conductive period of the first semiconductor switch, and a resistor coupled to the capacitor to provide a path for charging the capacitor after each discharge to regulate the time duration of the rectangular wave output pulse from the one-shot circuit;

a diode, having its anode coupled to the capacitor in the one-shot circuit and its cathode coupled to the differentiating circuit; and

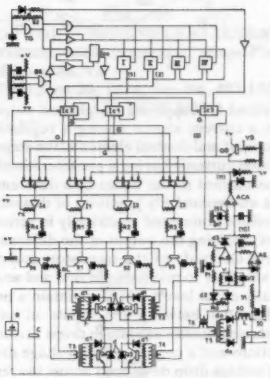
a second semiconductor switch, having input, output and common connections and having its output-common path coupled in parallel with said capacitor, and having its input connection coupled to the same point of the differentiating circuit as is the cathode of the diode, to complete a discharge path for said capacitor upon receipt of each positive-going signal from the differentiating circuit.

3,947,703

REGULATED SUPPLY UNITS

Jean-Pierre Scholler, Maisons Laffitte, France, assignor to Compagnie Internationale Pour L'Informatique, Louveciennes, France

Filed Oct. 11, 1974, Ser. No. 514,227
Int. Cl.² H03K 17/00
U.S. Cl. 307—297 11 Claims



1. A regulated power supply system comprising in combination:

a. a four legged bridge, each leg of which includes at least one high frequency switched power transistor;

b. a source of DC voltage connected across one diagonal of said bridge;

c. a regulated output transformer connected across the other diagonal of said bridge;

d. clock controlled time base means;

e. first and second pairs of switching circuits for said power transistors connected to control respectively, pairs of said transistors in diagonally opposite legs of said bridge;

f. first and second circuits connected to said time base means for deriving therefrom first and second wave forms in relative phase opposition and connect said wave forms to the control inputs of said first and second pairs of switching circuits;

g. each of said switching circuits including a transformer having a center tapped secondary winding connected across the collector emitter of at least one said power transistor and the tap connected to the base of the same transistor;

h. a reference wave form generator;

i. an error signal forming circuit connected to compare the secondary voltage of said output transformer with a reference voltage;

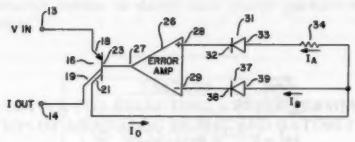
j. a regulation signal forming circuit connected to receive said error signal and the output of said reference waveform generator and compare said signal; and

k. means applying the output of said regulating signal forming circuit to one only of the transistor switching control circuits of said first pair and to one of the transistor switching circuits of said second pair, one of said switching circuits connected respectively to control two legs of said bridge connected to the same side of said DC voltage source.

3,947,704
LOW RESISTANCE MICROCURRENT REGULATED CURRENT SOURCE

Robert A. Blauschild, Sunnyvale, Calif., assignor to Signetics, Sunnyvale, Calif.

Filed Dec. 16, 1974, Ser. No. 532,767
Int. Cl.² H03K *1/12*
U.S. Cl. 307—297 **9 Claims**

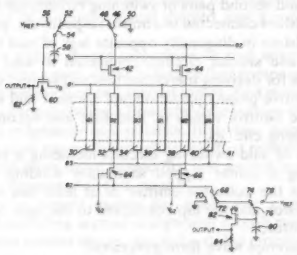


8. In a method for supplying a regulated output current to a load from a current source having a regulating transistor with input, output and control elements, the steps of: applying first and second currents having a predetermined relationship to the output current to the inputs of a differential amplifier through first and second PN junctions of dissimilar areas and through a resistor connected electrically in series with one of the junctions, applying the output of the differential amplifier to the control electrode of the transistor, and operating the differential amplifier to maintain the first and second currents at substantially equal levels and to maintain a predetermined voltage differential between the inputs of said amplifier, thereby producing dissimilar voltage drops across the first and second junctions and a corresponding voltage drop across the resistor, the voltage drop developed across the resistor and the value of the resistor determining the level of the first and second currents and therefor the level of the operating current.

3,947,705
METHOD AND SYSTEM FOR ACHIEVING AND SAMPLING PROGRAMMABLE TAP WEIGHTS IN CHARGE COUPLED DEVICES

Stephen Perry Emmons, Dallas, Tex., assignor to Texas Instruments Inc., Dallas, Tex.

Filed Oct. 24, 1974, Ser. No. 517,565
Int. Cl.² H03K *5/18*; H01L *27/00, 31/00*; G11C *19/00*
U.S. Cl. 307—304 **15 Claims**



3. A circuit for selectively detecting and weighting signals stored at selected charge storage sites of a charge coupled device shift register having electrically continuous phase electrodes located adjacent charge storage sites including said selected charge storage sites of said shift register, wherein transfer of signal charge from one charge storage site to an adjacent site is effected by selective connection of said electrodes to clocked phase voltage sources for supplying current to charge said electrodes to a predetermined voltage, the charging current supplied to a particular electrode depending on the magnitude of signal charge stored at the charge storage site adjacent said electrode, said selective detecting and weighting circuit comprising:

first and second supply voltage lines; for each electrode adjacent one of said selected charged storage sites

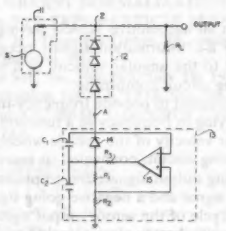
circuit means for controlling supply of charging current for charging said electrode to said predetermined voltage, said circuit means including a first insulated gate field effect transistor having a channel connected between said phase electrode and said first supply voltage line; means for applying a predetermined first gate voltage to the gate of said first transistor to provide a desired clock voltage to said one phase electrode to supply through said first transistor charging current to said electrode; a second insulated gate field effect transistor having a channel connected between said one phase electrode and said second supply voltage line; means for applying an individually adjustable preselected second voltage not greater than said first gate voltage to the gate of said second transistor to control the percentage of charging current applied to said one phase electrode through said second transistor; and

means common to all of said selected phase electrodes for detecting and integrating the charging currents applied to said phase electrodes by at least one of said first and second transistors in order to provide a weighted analog of the total signal charge stored adjacent said selected phase electrodes.

3,947,706
VOLTAGE AND TEMPERATURE COMPENSATED LINEAR RECTIFIER

Julian C. Holmes, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 30, 1975, Ser. No. 573,276
Int. Cl.² H03K *3/26*
U.S. Cl. 307—310 **5 Claims**



1. A rectifier compensating circuit comprising:

at least one diode rectifier having a first and second terminal;

a standard diode rectifier, having first and second terminals, said first terminal being coupled in series to the second terminal of said at least one diode rectifier;

a first resistor coupled in series to the second terminal of said standard diode rectifier;

a second resistor coupled in series with said first resistor and to ground;

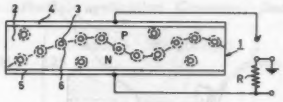
an operational amplifier having a positive input coupled to the junction between said first and second resistor, a negative input coupled to the first terminal of said standard diode rectifier, and an output coupled to the second terminal of said standard diode rectifier; and

means for coupling an alternating source of input voltage between ground and said first terminal of said at least one diode rectifier.

3,947,707
JFET OPTICAL SENSOR WITH CAPACITIVELY CHARGED BURIED FLOATING GATE

John Martin Shannon, Whyteleafe; John Ernest Ralph, Crawley Down, and Pieter Schagen, Redhill, all of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed June 12, 1974, Ser. No. 478,609
Claims priority, application United Kingdom, June 18, 1973, 28849/73
Int. Cl.² H01L 31/00
U.S. Cl. 307—311 24 Claims

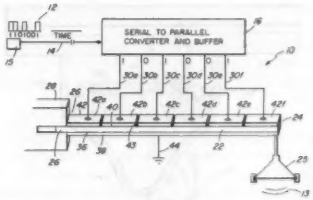


1. A solid state device comprising a bulk semiconductor layer having distributed within a plurality of isolated discrete regions each forming a potential barrier with the semiconductor bulk, said discrete regions being embedded within and surrounded by the bulk semiconductor and being at floating potential, electrode means coupled to the layer, a source of charging potential, means for applying a potential pulse derived from the charging source by means of the electrode means across a portion of said layer for charging the discrete regions therein to reverse bias their barriers producing depletion zones surrounding the discrete regions, the discrete regions and potential barriers thereof being of a configuration and being distributed within the layer such that following application of a charging pulse the discrete regions remain sufficiently charged to support depletion zones in the bulk semiconductor that cause a condition of low electrical conduction through the layer portion when an interrogating voltage is applied thereto, a source of interrogating voltage, and means for interrogating the charge condition of the layer portion including means for applying a voltage derived from the interrogating source by means of the electrode means across said portion of said layer.

3,947,708
APPARATUS FOR AND METHOD OF CONVERTING FROM A DIGITAL SIGNAL TO AN ACOUSTIC WAVE USING A PIEZOELECTRIC BEAM

John E. Fulenwider, Concord, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Nov. 27, 1974, Ser. No. 527,668
Int. Cl.² H01L 41/04
U.S. Cl. 310—8.1 14 Claims



1. An apparatus for converting a sequence of digital words representative of speech in a time division multiplexed format into an acoustic signal, each word having a plurality of magnitude bit locations comprising:

a. means for converting the magnitude bits into a plurality of voltages, each of which represents the occurrence of a bit in one of the magnitude bit locations,

b. a beam made of a piezoelectric material and having a free and fixed end,

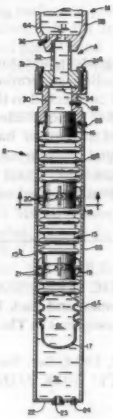
c. means for applying each of the plurality of voltages across each of a plurality of elements of the beam to create a deflection of the free end of the beam related to the magnitude of the digital word, the deflection being in a direction substantially perpendicular to the length of the beam, and

d. means responsive to the deflection of the free end for generating an acoustic signal related to the sequence of digital words.

3,947,709
PROTECTOR FOR SUBMERSIBLE ELECTRIC MOTORS

Robert E. Waltman, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed June 20, 1974, Ser. No. 481,131
Int. Cl.² H02K 5/12
U.S. Cl. 310—87 15 Claims



1. An apparatus for protecting, from corrosive fluids, submersible electric motors which are filled with lubricating liquid which includes:

a. a reservoir shield means being filled with a reservoir shield liquid and having an upper end and a lower end, said upper end being permanently sealed to prevent reservoir shield liquid leakage from said upper end and said lower end being temporarily sealed to prevent reservoir shield liquid leakage from said lower end prior to insertion of said shield means in said corrosive fluids, said temporary seal being a destructible plug which will destruct when said insertion occurs so that said reservoir liquid and said corrosive fluids will be communicative one with the other;

b. a liquid-filled, resiliently deformable reservoir means within said reservoir shield means; and

c. an attaching means for attaching said reservoir means to said electric motor housing and for achieving communication between said reservoir liquid and said lubricating liquid.

3,947,710

FLYWHEEL TYPE MAGNETO GENERATOR FOR A ROTARY ENGINE

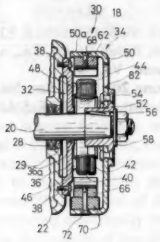
Mitsunori Miyamoto, Numazu, Japan, assignor to Kokusan Denki Co., Ltd., Numazu, Japan

Filed July 25, 1974, Ser. No. 491,813

Claims priority, application Japan, July 27, 1973, 48-88296[U]; Oct. 1, 1973, 48-114532[U]; Oct. 1, 1973, 48-114533[U]; Oct. 1, 1973, 48-114534[U]

Int. Cl.² H02K 21/22

U.S. Cl. 310—153 7 Claims



1. A flywheel type magneto generator for a rotary engine comprising a stator including generating coil means and a rotor including a flywheel connected to the output shaft of the rotary engine and magnet field means mounted on said flywheel, said flywheel of said rotor having balance weight means comprising a bulged portion radially and outwardly bellied from the cylindrical wall of said flywheel and further comprising a weight element mounted on the inner surface of said bulged portion.

3,947,711

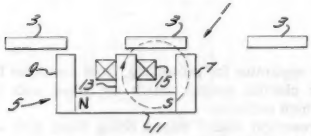
MAGNETIC SPEED SENSOR

Rex Wallace Presley, Livonia, and Jack Richardson Lorraine, Howell, both of Mich., assignors to The Bendix Corporation, South Bend, Ind.

Filed June 13, 1974, Ser. No. 478,994

Int. Cl.² H02K 21/38

U.S. Cl. 310—155 10 Claims



1. A speed sensor for a vehicle wheel comprising a tone wheel driven by the vehicle and subject to misalignment and vibration, the tone wheel being made of magnetic material and having a plurality of teeth, and sensing means having a pair of switching poles of magnetic material and a sensing pole of square loop magnetic material positioned between the switching poles, the poles being positioned proximate the tone wheel teeth, coil means on the sensing pole, and means for magnetizing the poles to induce a signal voltage in the coil means corresponding to wheel speed and substantially free of noise components due to misalignment and vibration of the tone wheel upon relative rotation of the tone wheel and sensing means.

3,947,712

FREQUENCY TRANSMITTER FOR SIGNALING THE SLIPPAGE OF VEHICLE WHEELS

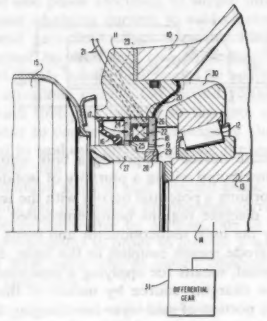
Manfred H. Burckhardt, Waiblingen; Walter Lutze, Esslingen, and Paul Schwerdt, Esslingen-Hegensberg, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Jan. 19, 1972, Ser. No. 219,018

Claims priority, application Germany, Jan. 26, 1971, 2103381

Int. Cl.² H02K 19/20

U.S. Cl. 310—168 14 Claims



1. A frequency transmitter combined with a differential gear for the transmission of signals to control the slippage of wheels of motor vehicles, which includes two mutually cooperating toothed means of which one toothed means is rotatably arranged whereas the other does not rotate, and with one of the toothed means adapted to be magnetized, characterized in that the rotating toothed means is secured at the circumference of each output shaft of the differential gear, said rotating toothed means cooperating with a fixed toothed means which is arranged in a bearing cover means of the differential gear between a bearing for a spur bevel gear housing and a retaining ring means providing an oil seal with respect to the outside.

3,947,713

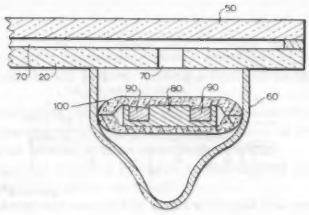
MERCURY CAPSULE ASSEMBLY FOR DISPLAY PANEL

George J. Przybylek, Martinsville, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed Apr. 18, 1975, Ser. No. 569,223

Int. Cl.² H01J 61/24

U.S. Cl. 313—174 7 Claims



1. Apparatus for introducing a vapor into a chamber comprising

an envelope having a chamber into which a vapor is to be introduced,

a tubulation secured to said envelope in communication with said chamber,

a carrier carrying a substance for providing said vapor, said carrier being dispsosed in said tubulation, and

a mass of fibrous material enclosing said carrier and insulating said carrier from the wall of said tubulation.

3,947,714
METAL IODIDE VAPOUR DISCHARGE LAMP

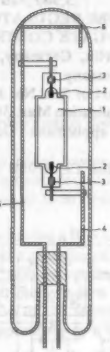
Ludwig Rehder, Rathausstrasse 33; Renate Kaiser, Wilhelmstrasse 44, and Roland Lorenz, Bruckstrasse 19, all of 51 Aachen, Germany

Filed Nov. 25, 1974, Ser. No. 527,043

Claims priority, application Germany, Dec. 21, 1973, 2363843

Int. Cl.² H01J *61/18*

U.S. Cl. 313—225 **5 Claims**



1. Metal iodide vapour discharge lamp comprising a discharge vessel which contains a noble gas for starting, a metal and iodine in an amount equivalent to that of the metal, characterized in that in order to obtain an iron spectral lamp the discharge vessel contains iron iodide (FeI_2) and hydrogen.

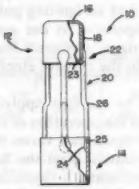
3,947,715
FAST WARM UP CATHODE FOR A CATHODE RAY TUBE

Peter George Puhak, Seneca Falls, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed June 10, 1975, Ser. No. 585,707

Int. Cl.² H01J *1/94, 19/48*

U.S. Cl. 313—270 **4 Claims**



1. A fast warm-up cathode for a cathode ray tube comprising: a substantially cup-shaped top cap; a hollow cylindrical sleeve longitudinally axially separated from said top cap; and means joining said sleeve and said top cap into an integral unit, said means comprising a plurality of individual rod-like members having extremities providing substantially flat attachment surfaces for said sleeve and said top cap.

3,947,716
FIELD EMISSION TIP AND PROCESS FOR MAKING SAME

Donald L. Fraser, Jr., Laurel, and Bruce Perger, Glen Burnie, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 27, 1973, Ser. No. 392,147

Int. Cl.² B05D *5/12;* **H01J** *19/10*

U.S. Cl. 313—336 **7 Claims**

1. A field emission tip comprising:

a base material of a single crystal metal having an emitting planar surface and a plurality of non-emitting planar surfaces, said emitting surface having a reduced work function due to misalignment of the lattice atoms of said crystal metal, said non-emitting surfaces having an increased work function due to realignment of the lattice atoms of said crystal metal,

and a monolayer of metal adsorbate atoms on said emitting surface.

4. A process for the selective deposition of a metal adsorbate onto a field emission tip of a single crystal metal comprising the steps of:

placing said tip in a suitable vacuum;

flashing said tip until said tip becomes clean;

creating an electrostatic field around said tip;

flashing said tip in the presence of said electrostatic field, thereby creating surface migration of atoms of said single crystal metal along said tip until said tip surface is composed of faceted planes, and

depositing a monolayer of metal adsorbate atoms onto said tip.

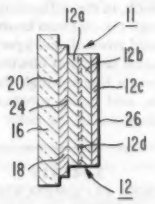
3,947,717
PHOTOCONDUCTOR OF CADMIUM SELENIDE AND ALUMINUM OXIDE

Charles John Busanovich; John Theodore Fischer, both of Princeton; Robert Milton Moore, Rocky Hill, and John A. van Raalte, Princeton, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 31, 1975, Ser. No. 563,681

Int. Cl.² H01J *29/45, 31/38*

U.S. Cl. 313—386 **30 Claims**



1. A photoconductive device comprising:

a. a photoconductive body including in a direction of thickness:

1. a first material region substantially of n type electrical conductivity cadmium selenide;

2. a second material region substantially of aluminum oxide;

3. a transition region along an interfacing region between said first and second material regions consisting of a graded atomic transition of the material compositions of said first and second material regions;

b. a blocking contact within a portion of said photoconductive body including said transition and second material regions;

c. contacting means for applying an electrical potential across opposed major surfaces of said body whereby charged carriers may be conducted through said body in

said direction of thickness in accordance with light impinging on said body.

3,947,718

SHADOW MASK HAVING ELONGATED APERTURES CONCAVE TO VERTICAL CENTER LINE AND INCREASING IN PITCH ALONG X-AXIS WITH DISTANCE FROM SAID LINE

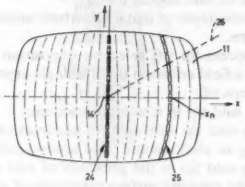
Johannes Gerardus van Lent, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 14, 1974, Ser. No. 442,655

Claims priority, application Netherlands, Mar. 6, 1973, 7303077

Int. Cl.² H01J *29/07, 31/20*

U.S. Cl. 313—408 **1 Claim**



1. A cathode-ray tube for displaying colored pictures comprising in an evacuated envelope means to generate at least two electron beams the axes of which are located in one flat plane, means to deflect said electron beams in a predetermined deflection region, a display screen comprising a large number of linear regions extending in a transverse direction to said plane and each luminescing in a different color, and a color selection electrode which is curved in two directions and comprises a large number of elongate apertures which are arranged in rows assigned to corresponding linear luminescent regions, said electron beams being each associated with luminescent regions of one color by means of the said color selection electrode, the rows of apertures on either side of a central row being curved such that the center line of each of the said rows of apertures is located substantially in a flat plane coinciding with a line which, in the deflection region, intersects the said flat plane through the electron beams at right angles, and the pitch between said rows of said apertures increasing from the center of the color selection electrode toward the edges when measured along a line through the center and at right angles to said rows, and being substantially constant when measured along a diagonal of the color selection electrode.

3,947,719

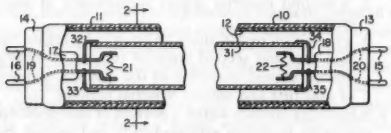
FILTERED FLUORESCENT LAMP

John Nash Ott, Sarasota, Fla., assignor to John Ott Laboratories, Inc., Sarasota, Fla.

Continuation of Ser. No. 456,272, March 29, 1974, abandoned. This application June 2, 1975, Ser. No. 583,195

Int. Cl.² H01J *61/40, 1/70*

U.S. Cl. 313—489 **4 Claims**



1. In a fluorescent lamp the combination comprising:;

a. an envelope having a phosphor coating thereon,

b. an ionizable medium within said envelope,

c. a pair of electrodes mounted within said envelope between which an arc discharge occurs upon operation of the lamp, and

d. filtering means arranged to extend between said phosphor coating and the path of said arc discharge, said filtering means comprising a material which has an internal transmittance with respect to arc radiation passing therethrough of not less than 70 percent in the ultraviolet phosphor-excitation range and not more than 40 percent in the visible range whereby the filtering means passes ultraviolet radiation from said arc discharge which excites said phosphor coating to produce visible light while substantially attenuating radiation from said arc discharge in the visible range which would otherwise cause spectral distortion in the light output of the lamp.

3,947,720

PULSED FLASH TUBE REGULATOR USING THYRISTOR GATE CONTROL

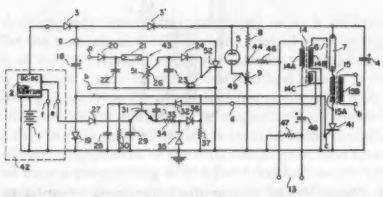
Lutz Breitkreuz, Berlin, Germany, assignor to Loewe-Opta GmbH, Berlin, Germany

Continuation-in-part of Ser. No. 17,841, March 9, 1970, abandoned. This application Mar. 30, 1972, Ser. No. 239,772

Claims priority, application Germany, Mar. 8, 1969, 1911832

Int. Cl.² H05B *37/02*

U.S. Cl. 315—151 **7 Claims**



1. Apparatus for automatically adjusting the operating duration of a triggerable flash tube to obtain a controllable quantity of light energy therefrom which comprises:

first means including a normally closed controllable gate serially connected with the flash tube for applying operating voltage to the flash tube when the gate is open, the gate having a control electrode responsive to signals of one polarity for opening the gate and responsive to signals of the opposite polarity for closing the gate;

second means for selectively applying an igniting pulse to the trigger electrode of the flash tube, the tube being operated by the simultaneous application thereto of operating voltage and an igniting pulse;

third means responsive to the application of the igniting pulse to the trigger electrode for applying a signal of the one polarity to the control electrode of the gate to open the gate;

means coupled to the first applying means and rendered effective upon the operation of the flash tube for generating a control signal that varies in proportion to the total light energy emitted from the flash tube;

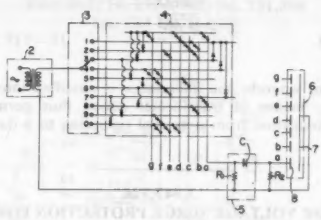
fourth means including a thyristor having a normally disabled transconductive path for reversing the polarity of the signal applied to the control electrode of the gate by the third applying means when the transconductive path of the thyristor is enabled, the thyristor having a control electrode triggerable when a voltage applied thereto is at least a predetermined value for enabling the transconductive path of the thyristor; and

means for coupling the output of the generating means to the control electrode of the thyristor.

3,947,721
LIQUID CRYSTAL DEVICE

Keniti Suenami, Neyagawa; Kazuhiko Shimizu, Osaka, and Kazuo Ogata, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Company, Ltd., Osaka, Japan

Filed June 20, 1974, Ser. No. 481,236
Claims priority, application Japan, June 22, 1973, 48-75040[U]
Int. Cl.² H05B *37/00*
U.S. Cl. 315—169 TV **3 Claims**

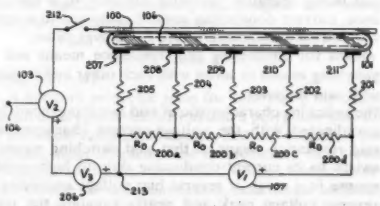


1. A liquid crystal display system comprising:
an AC power source;
a liquid crystal display panel having a common electrode and a plurality of segment electrodes, said segment electrodes being arranged to form desired symbols;
diode matrix means;
selection switch means having a first contact coupled to said AC power source and a plurality of second contacts, each second contact on said selection switch means being coupled through said diode matrix means to said display panel for energization of the segment electrodes of said display panel corresponding to a specific symbol to be displayed, and
DC rejection circuit means interposed between said diode matrix means and said display panel, said DC rejection circuit means applying only the AC components of the voltages at the outputs of said diode matrix means across the common electrode and selected segment electrodes of said liquid crystal display panel.

3,947,722
ELECTRONIC SCAN METHODS FOR PLASMA DISPLAYS

Richard Albert Strom, Richfield; William Norman Mayer, White Bear Lake, and Robert Wallace Johnson, Bloomington, all of Minn., assignors to Control Data Corporation, Minneapolis, Minn.

Filed June 19, 1974, Ser. No. 480,644
Int. Cl.² H05B *37/00*
U.S. Cl. 315—169 TV **15 Claims**

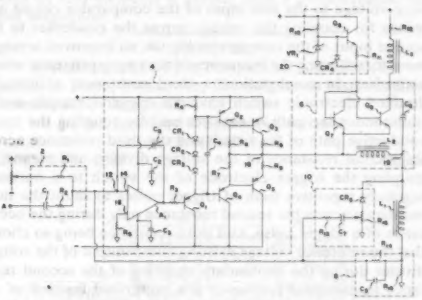


1. In an electronically powered threshold device light source of the type producing visible light from those segments of a two-sided interface zone therein across which a voltage difference in excess of a threshold value exists, an improvement for producing light from selected segments of the interface zone in a preselected order responsive to a control signal, and comprising:
a. a conductor adjacent a first side of the interface zone, and having first and second points adjacent first and second segments of the interface zone respectively;
b. an impedance adjacent a second said of the interface zone generally spaced across the interface zone from the first side, having first and second points adjacent the first and second segments respectively, and having appreciable impedance between its first and second points;
c. a first voltage source of preselected value connected between the first and second points of the impedance; and
d. a second voltage source connected between the conductor and the impedance, whose voltage output varies responsive to the control signal from a value creating a voltage difference between the first points of the conductor and the impedance at least equal to the threshold value, to a value simultaneously creating voltage differences between the first points of the conductor and the impedance and between the second points of the conductor and the impedance both at least equal to the threshold value.

3,947,723
LOW POWER HIGH FREQUENCY HORIZONTAL DEFLECTION AMPLIFIER

James P. Thompson, San Jose, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Mar. 25, 1974, Ser. No. 454,686
Int. Cl.² H01J *29/70*
U.S. Cl. 315—389 **6 Claims**



1. A control arrangement for controlling the horizontal deflection of a cathode ray display comprising, in combination,
a controlled amplifier for driving an inductive horizontal deflection yoke means, said amplifier providing both voltage and current amplification,
switching means with at least one transistor, the emitter of said transistor connected to the output of said controlled amplifier,
a first circuit network including a first inductor means and a first resistor, said first circuit network connected to a source of positive potential and the collector of said transistor,
a second circuit network including a first capacitor, said inductive yoke means and a second resistor connected in series, said second circuit network connected to ground and the junction of said first circuit network and the collector of said transistor,
a feedback network and a damping network, said feedback network and damping network connected between said second circuit network and the input to said controlled amplifier,

3,947,724

VARIABLE-FREQUENCY SWEEP GENERATOR CIRCUIT

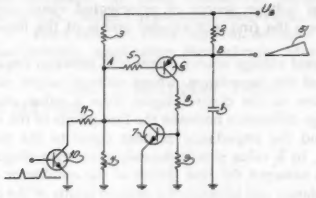
Erich Geiger, Friesen, Germany, assignor to Loewe-Opta GmbH, Kronach, Germany

Filed Nov. 7, 1974, Ser. No. 521,661

Claims priority, application Germany, Nov. 9, 1973, 2356021

Int. Cl.² H01J 29/74

U.S. Cl. 315—410 **3 Claims**



1. In a variable frequency sweep circuit having a condenser changeable through a resistance whereby the voltage across the condenser establishes the sweep, a voltage divider including at least first and second resistances, the divider generating at its output a reference voltage determined by the ratio of the resistances, a normally disabled comparator circuit having first and second inputs and an output connected across the condenser, the output of the comparator circuit normally exhibiting a high output impedance when the voltage at its first input exceeds the voltage at its second input, the comparator circuit being triggerable to a low output impedance when the voltage at its second input exceeds the voltage at its first input to terminate the sweep, means for coupling the reference voltage to the first input of the comparator circuit and means for coupling the voltage across the condenser to the second input of the comparator circuit, an improved arrangement for adjusting the frequency of the sweep generator which comprises, in combination, a third resistance, a normally disabled electronic switch having a trigger electrode and a transconductive path, means for serially coupling the transconductive path of the switch and the third resistance across the second resistance of the voltage divider, and means for coupling the trigger electrode of the switch to a normally regularly repetitive train of trigger pulses to shunt the third resistance across the second resistance only during the occurrence of a trigger pulse, said third resistance being so chosen that the reference voltage existing at the output of the voltage divider during the momentary shunting of the second resistance by the third resistance is a prescribed fraction of the maximum reference voltage to establish a correspondingly prescribed time interval within the sweep at which the comparator circuit is operable to its low output impedance condition.

3,947,725

PROTECTIVE SYSTEM FOR A CAPACITOR VOLTAGE TRANSFORMER

Howard R. Lucas, 398 Lake Promenade, Toronto, Ontario, Canada

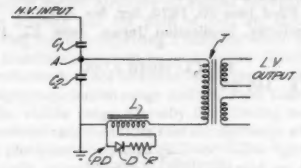
Filed Nov. 6, 1973, Ser. No. 413,395

Claims priority, application Canada, Nov. 9, 1972, 156085

Int. Cl.² H02H 7/16

U.S. Cl. 317—12 B **2 Claims**

1. Improvements in a protective system of a circuit in a capacitor voltage transformer which includes an inductance in the circuit thereof minimizing the occurrence of dangerous overvoltages upon occurrence of an abnormal overvoltage applied thereto, permitting the voltage to return to normal promptly and smoothly upon removal of the occurrence, said improvement comprising means short circuiting only a portion of the winding of said inductance for modifying the inductive value of said inductance, a triggering device in series in said short circuiting means and operative only above a predetermined condition and in response to occurrence of said abnormal condition and resistance means in series with said trigger-



ing means whereby the inductance is modified into a resistance by means of transformer action thus permitting a smooth transition from a normal operation to a dampening mode.

3,947,726

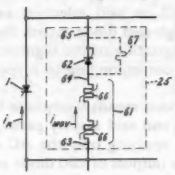
REVERSE VOLTAGE SURGE PROTECTION FOR HIGH-VOLTAGE THYRISTORS

Angelo L. DeCecco, Newtown Square; Donald M. Demarest, Wallingford; Dante E. Piccone, Philadelphia, and Istvan Somos, Lansdowne, all of Pa., assignors to General Electric Co., Philadelphia, Pa.

Filed Dec. 18, 1974, Ser. No. 534,030

Int. Cl.² H02H 7/14

U.S. Cl. 317—16 **10 Claims**



1. An improved scheme for protecting a thyristor having a pair of main electrodes adapted to be connected in an electric power circuit where they are periodically subjected to a reverse bias voltage (anode potential negative with respect to cathode), said thyristor being adapted to switch from a reverse blocking state to a reverse current conducting state if the instantaneous magnitude of the reverse bias voltage increases to a level sufficiently in excess of a predetermined repetitive peak reverse voltage to cause an avalanche breakdown therein, wherein the improvement comprises:

a. non-linear resistance means comprising at least one metal oxide varistor;

b. switching means having a normal high-resistance state and being operative to switch abruptly to a low-resistance, current conducting state if subjected to a voltage which attains a predetermined breakover value;

c. means for connecting said resistance means and said switching means in series with each other and in parallel with said thyristor;

d. the switching characteristic of said switching means being coordinated with the voltage-current characteristic of said resistance means so that said switching means will switch to its current conducting state in high-speed response to a surge of reverse bias voltage exceeding said reverse voltage peak and nearly equaling the reverse breakdown level of said thyristor;

e. said voltage-current characteristic of said non-linear resistance means being coordinated with the reverse breakdown characteristic of said thyristor so that, when said switching means switches to its current conducting state, surge current will divide between said resistance

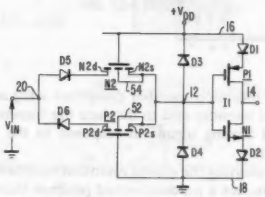
means and said thyristor in such proportions that the maximum reverse current flowing through said thyristor is lower than a predetermined critical magnitude which can damage said thyristor.

3,947,727

PROTECTION CIRCUIT FOR INSULATED-GATE FIELD-EFFECT TRANSISTORS

Roger Green Stewart, Neshanic Station, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 10, 1974, Ser. No. 531,394
Int. Cl.² H02H *3/20*
U.S. Cl. 317—31 **13 Claims**



1. A protection circuit for an insulated gate field transistor (IGFET) whose gate is connected to an input node, said protection circuit comprising:

first and second asymmetrical devices each having a low impedance forward current direction and a high impedance reverse current direction;

first and second transistors of first and second conductivity types, respectively, each having a conduction path and a control electrode;

a signal input terminal;

means connecting said first asymmetrical conducting device in series with the conduction path of said first transistor between said signal input terminal and said input node, with said first asymmetrical conducting device connected to conduct current from said signal input terminal to said input node in its low impedance direction;

means connecting said second asymmetrical conducting device in series with the conduction path of said second transistor between said signal input path and said input node, with said second asymmetrical conducting device connected to conduct current from said input node to said input terminal in its low impedance direction; and

means for connecting the control electrodes of said first and second transistors to first and second different bias points, respectively.

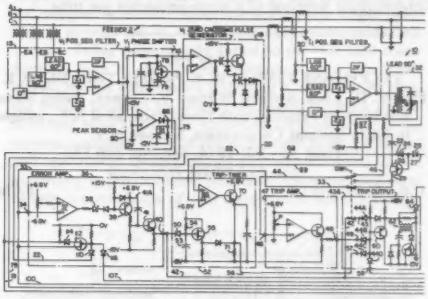
3,947,728

NETWORK PROTECTOR RELAY

David R. Smith, McKeesport, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 23, 1974, Ser. No. 472,773
Int. Cl. H02h *3/36, 3/26*
U.S. Cl. 317—47 **14 Claims**

1. A network protector relay for controlling the connection between a polyphase feeder bus and a polyphase network bus, said protector relay comprising a first circuit means having a polyphase input adapted to be connected to said connection for energization by the current and voltage components of the power flowing in said connection, said means including elements which determine the magnitude of one of said components with respect to the other of said components at first and second time intervals in the wave of said other component, selecting means selecting which one of said time intervals is operative, said first circuit means having an output energized in accordance with the magnitude of said one component, a second circuit means having a polyphase input adapted to be connected to said network bus for energization by at least one of said voltage and current components of said network bus and having an output, said second circuit means including a fault detector energized by said one component of said network bus and effective to provide said output of said second circuit means with an output signal in response to a fault responsive condition of said one component of said network bus of at least a predetermined magnitude, means connecting said output of said second circuit means to said selecting



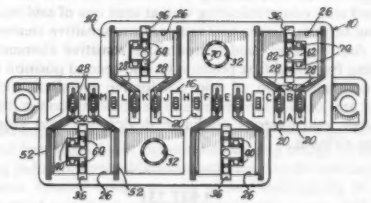
means of said first circuit means, said selecting means being effective in the absence of said output signal to select said first time interval and effective in the presence of said output signal to select said second time interval, and disconnect control means connected to said output of said first circuit means, said disconnect control means being effective to interrupt the connection between said feeder bus and said network bus solely when said magnitude of said one component as established by said elements is greater than a predetermined desired magnitude.

3,947,729

SURGE PROTECTOR TERMINAL ASSEMBLY

Charles L. Tesch, Bensenville, Ill., assignor to Methode Electronics, Inc., Chicago, Ill.

Filed Jan. 16, 1975, Ser. No. 541,644
Int. Cl.² H02H *9/06*
U.S. Cl. 317—61.5 **5 Claims**



1. A surge-protector gas tube terminal assembly comprising: an insulative terminal block presenting parallel outer and inner faces and being formed with a group of side-by-side lengthwise-spaced-apart terminal apertures extending transversely of said outer and inner faces, a set of gas tube cavities on each side of said group of terminal apertures, a plurality of slots extending between the ends of said gas tube cavities and certain of said terminal apertures, an elongated ground clip recess on each side of said group of terminal apertures, and a plurality of openings extending between the ends of said ground clip recesses and the intermediate portions of said gas tube cavities; a plurality of terminals disposed in said terminal apertures; a plurality of gas tube end clips each having a contact portion disposed at one end of one of said gas tube cavities, an anchor portion disposed in one of said terminal apertures and connected to the adjacent one of said terminals,

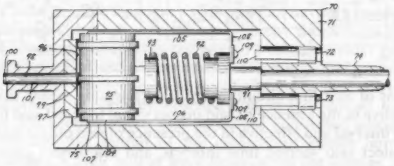
and a web portion disposed within the associated one of said slots and interconnecting said contact portion and said anchor portion; a pair of gas tube ground clips each having a body portion disposed in one of said ground clip recesses, and spring arms projecting through said openings into the adjacent ones of said gas tube cavities; and said contact portions in each of said gas tube cavities being adapted to grip the end terminals of a surge-protector gas tube, and said spring arms in each of said gas tube cavities being adapted to grip the intermediate terminal of a surge-protector gas tube.

3,947,730

TELEPHONE LINE SURGE PROTECTING DEVICE

Paul V. De Luca, Syosset; William V. Carney, Valley Stream, and Michael Fasano, South Floral Park, all of N.Y., assignors to Porta Systems Corporation, Syosset, N.Y.

Filed July 22, 1974, Ser. No. 490,553
Int. Cl.² H02H *3/22, 7/20*
U.S. Cl. 317—61.5 **1 Claim**



1. An improved telephone line surge protecting device comprising: a casing element defining a cavity, telephone input and output terminals having inner ends communicating with said cavity, a grounding prong element penetrating said casing element and communicating with said cavity, a temperature sensitive element mounted for sliding movement between first and second positions within said cavity, resilient means urging said temperature sensitive element from said first to said second position, temperature sensitive means resisting said resilient means; said temperature sensitive element including a gaseous discharge device and electrically conductive members communicating with said gaseous discharge device substantially at one end thereof, and having second ends communicating with at least one of said input and output terminals when said temperature sensitive element is in said first position; said temperature sensitive element upon moving from said first position to said second position breaking communication of said conductive members with said input and output terminals, and establishing communication between said gaseous discharge device and said grounding prong element.

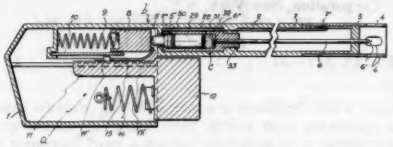
3,947,731

PIEZOELECTRIC LIGHTER

Ernesto A. Vainer, Buenos Aires, Argentina, assignor to Manufactura de Articulos para el Hogar "Aurora" Sociedad Anonima Industrial Comercial, Inmobiliaria y Financiera, Argentina

Filed Dec. 9, 1974, Ser. No. 530,603
Claims priority, application Argentina, June 14, 1974, 254216; June 17, 1974, 254243
Int. Cl.² F23Q *2/28, 3/01*
U.S. Cl. 317—81 **4 Claims**

1. A piezoelectric lighter which comprises:
a. a piezoelectric ignition unit having an impact terminal;
b. a displaceable actuation switch;
c. a first biasing means for providing a biasing force to return the actuation switch to its original position when displaced;
d. a movable hammer positioned to strike said impact terminal;
e. a second independent biasing means for providing a biasing force to displace said hammer;
f. said hammer, impact terminal and second biasing means being in axial alignment;
g. said hammer and second biasing means being positioned in a displaceable retention member adapted to be displaced by said actuation switch;
h. said hammer and actuation switch being detachably connected by an elastic retention member;



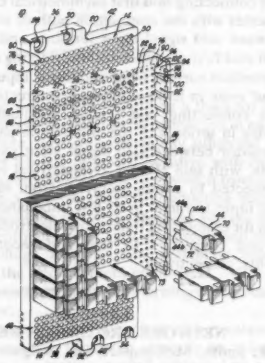
i. said elastic retention member comprises a lug adapted to engage said hammer and to displace the hammer against the second biasing means in response to the actuation switch; and
j. means for releasing the elastic retention member when the hammer reaches a predetermined position thereby causing the hammer to strike the impact terminal.

3,947,732

CONNECTOR BLOCK FOR TELEPHONE CENTRAL OFFICE MAIN DISTRIBUTING FRAME

Casimir Cwirzen, Des Plaines, Ill., assignor to Cook Electric Company, Morton Grove, Ill.

Continuation of Ser. No. 336,265, Feb. 27, 1973, abandoned.
This application July 26, 1974, Ser. No. 492,275
Int. Cl.² H02B *9/00*
U.S. Cl. 317—122 **16 Claims**



1. A connector block for telephone distributing equipment comprising:
an elongated mounting panel having front and rear panel faces and first and second elongated edges,
a plurality of sockets in said panel arranged in groups so as to form a plurality of socket groups, said socket groups being arranged in a plurality of rows and columns on said panel,
a plurality of terminal holes in said panel positioned adjacent said rows and columns of socket groups, said terminal hoeles being arranged in terminal hole groups adjacent said socket groups,
a fanning strip disposed along said first edge of said panel and including a flange extending forward beyond said

front panel face and an edge portion extending toward said rear face from said front face, and

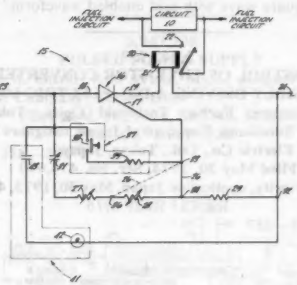
a plurality of apertures defined in said fanning strip, each aperture extending from the front face toward the rear face of the panel in said edge portion and extending laterally through said flange from the front face to the side of said panel.

3,947,733

CONTROL CIRCUIT

Charles Robert Chapman, 13620 S. Vermont Ave., Gardena, Calif. 90247, and James William Schooler, 2784 Diana Ave., Anaheim, Calif. 92806

Filed Jan. 27, 1975, Ser. No. 544,499
Int. Cl.² H03H *9/00*
U.S. Cl. 317—132 **14 Claims**



1. A temperature-actuated control circuit for controlling the application of a portion of an electrical circuit, comprising:

resistance means comprising at least a first resistance and a second, temperature-dependent resistance in series therewith;

an SCR connected to said resistance means for generating a signal in response to a predetermined threshold signal applied via said resistance means to a gate of said SCR in the presence of a reference potential applied to said SCR;

means for selectively applying the reference potential across said resistance means and said contact means, such that, upon attainment of a predetermined temperature by said second resistance, the threshold signal is applied to the gate of said SCR;

contact means including a pair of normally closed contacts in series with said resistance means and actuated in response to the generated signal for opening and closing said contacts; and

circuit path means connected across the electrical circuit portion and actuated by the generated signal for controlling the application of a circuit path bypassing the electrical circuit portion.

3,947,734

ELECTRONIC PERSONNEL SAFETY SENSOR

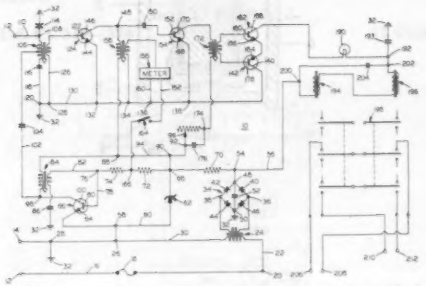
Norman F. Fyler, Deerfield, Ill., assignor to The Stanley Works, New Britain, Conn.

Filed Sept. 6, 1974, Ser. No. 503,970
Int. Cl.² G08B *13/26*
U.S. Cl. 317—146 **9 Claims**

1. An electronic personnel safety sensor operable to cause a machine or operation to be shut off to prevent injury to personnel or damage to equipment being protected comprising:

a. a power source including terminal means connectible to a power supply to provide to the sensor, said power source further including a bridge rectifier and a transformer connected in series circuit relation with said terminal means and AC coupled to said bridge rectifier;

b. electronic circuit means including a signal source and a multiplicity of AC coupled selectively saturable subsequent stages connected in series circuit relation with said signal source, said signal source providing a signal therefrom operable to effect excitation of said multiplicity of AC coupled selectively saturable subsequent stages, said electronic circuit means also including transformers interposed between successive ones of said multiplicity of AC coupled selectively saturable subsequent stages operable to provide the AC coupling therebetween, said transformers being purposefully tuned to provide said transformers with a preselected resonance, said electronic circuit means additionally including a capacitance sensing bridge coupled to said signal source having a predetermined state of balance condition corresponding to the normal operating state of the equipment being protected and operable to modify said signal from said signal source according to the deviation from said predetermined state of balance condition of said capacitance sensing bridge,



said capacitance sensing bridge having four legs, two of said four legs of said capacitance sensing bridge comprising inductors operable to inductively couple said capacitance sensing bridge to one of said multiplicity of AC coupled selectively saturable subsequent stages, said one of said multiplicity of AC coupled selectively saturable subsequent stages comprising amplifying means operable for amplifying said modulated signal received thereby from said capacitance sensing bridge, said amplifying means being coupled to another one of said multiplicity of AC coupled selectively saturable subsequent stages, said another one of said multiplicity of AC coupled selectively saturable subsequent stages comprising a relay driver; and

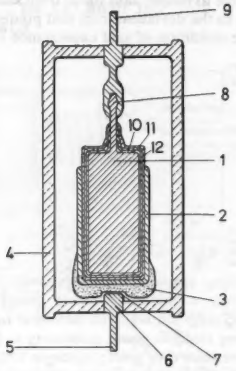
c. relay means connected in circuit relation with said relay driver and excitable by said modulated signal received thereby from said relay driver, said relay means being deactivated when said modulated signal departs from a preestablished level corresponding to said predetermined state of balance condition of said capacitance sensing bridge, said relay means comprising a pair of redundant relays and associated contacts.

3,947,735

GLASS ENCAPSULATED CAPACITOR WITH PRESSURE CONNECTED CATHODE LEAD

Peter Michael Hille, Nurnberg-Katzwang, and Klaus Rüdiger Petrikat, Grosschwarzenlohe, both of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Sept. 3, 1974, Ser. No. 502,572
Claims priority, application Germany, Sept. 20, 1973, 2347410
Int. Cl.² H01G 9/00
U.S. Cl. 317—230 8 Claims



1. In a glass enclosed electrolytic capacitor comprising a glass envelope, a sintered metal body within said envelope, a dielectric oxide layer on said body, a semiconductor layer on said dielectric oxide layer, a graphite conducting layer on said semiconductor layer, a conducting layer on the graphite, an anode lead sealed at one end of said envelope and connected to one end of said body, and a cathode lead sealed at the other end of said envelope, wherein the improvement comprises a deformable metal layer on said conducting layer at the other end of said body connected by pressure contact to said cathode lead; and said cathode lead pressure contact within said metal layer deforms said layer.

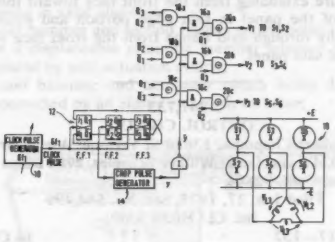
3,947,736

WAVEFORM SYNTHESIS USING SWITCHING CIRCUITS

David John Byers, Christchurch, New Zealand, assignor to New Zealand Inventions Development Authority, Wellington, New Zealand

Filed Sept. 3, 1974, Ser. No. 502,270
Claims priority, application New Zealand, Sept. 3, 1973, 171872; July 10, 1974, 174825
Int. Cl.² H02K 17/02
U.S. Cl. 318—227 68 Claims

1. A method for synthesising a waveform which upon integration will approximate a sinusoid having an amplitude proportional to frequency comprising: generating at least one base square wave having a selected frequency, generating a pulse waveform consisting of a fixed duration pulse occurring at least once each square wave half cycle, inverting said pulse waveform, enabling said inverted pulse waveform for a predetermined fraction of each square wave half cycle, and chopping said square wave with said enabled waveform.

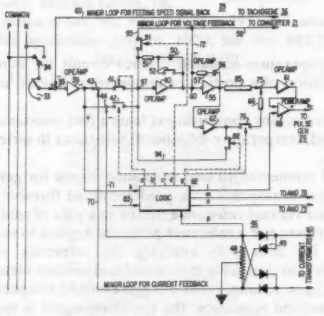


3,947,737

GATE CONTROL OF THYRISTOR CONVERTERS FOR REVERSIBLY DRIVING A D.C. ELECTRIC MOTOR

Takashi Kimura, Fuchu; Toshiyuki Ogita, Tokyo, and Takahiro Sumihana, Fussa, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed May 30, 1974, Ser. No. 474,699
Claims priority, application Japan, May 30, 1973, 48-60709
Int. Cl.² H02P 5/16
U.S. Cl. 318—257 7 Claims



1. A gate control for reversibly driving a D.C. electric motor comprising:

a first thyristor converter for operating as a rectifier for energizing the motor to drive it forward;

a second thyristor converter for remaining still during the time the motor runs in the forward direction;

means for energizing the motor from the first thyristor converter and then from the second thyristor converter;

means for connecting an A.C. voltage supply to the converters;

means for generating gating pulses synchronized with the frequencies of the A.C. voltage supply for the converters;

first and second gating circuits for selectively applying the gating pulses from the gating pulse generating means to gate electrodes of the converters;

means for comparing a voltage signal corresponding to the rotational speed signal of the motor with a speed reference voltage signal and for feeding a speed deviation voltage signal to the pulse generating means to phase shift the gating pulses to enable adjustment of the output voltage from the converter operating as a rectifier to adjust the motor speed to coincide substantially with the reference speed indicated by the speed reference voltage signal;

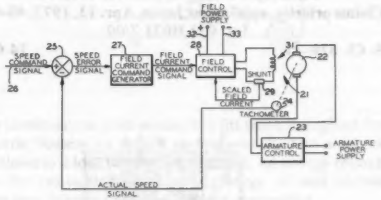
operational amplifier means having an integrating function for effecting current control of the converters in response to the deviation current signal by comparing the converter current with the deviation derived from the speed deviation feeding means to render the converter current substantially equal to the amplitude of the speed deviation; and

means for disconnecting the operational amplifier means from the speed deviation feeding means and for alternately applying an electrical voltage signal responsive to the motor speed and a modified feedback signal from the output terminal of the operational amplifier to an input terminal of the operational amplifier during the time the converters are switched from one state to another to prepare for reverse rotation of the motor so that the phase adjustment of the gating pulses emanating from the gate control follows the electrical signal voltage responsive to the motor speed during the time the thyristor converters are switched from one state to another.

3,947,738
PULSED POWER SUPPLY

Theodore A. Oliver, Ann Arbor, Mich., assignor to Reliance Electric Company, Euclid, Ohio

Filed Sept. 30, 1974, Ser. No. 510,498
Int. Cl.² H02P *7/28*
U.S. Cl. 318—341 **32 Claims**



1. An apparatus for controlling current flow in a load, comprising:

a power source for supplying unipolar voltage;

switching means for selectively connecting said power source across said load for applying the voltage with a first polarity during a first time interval and for applying the voltage with a second polarity opposite said first polarity during a second time interval; and

control means for defining said first and second time intervals including:

means responsive to the current flowing in said load for generating an average voltage error signal;

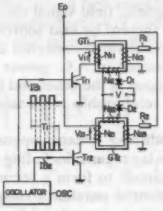
means for generating a switch control signal in response to said average voltage error signal and said switch control signal for controlling said switching means.

3,947,739
REGENERATIVE BRAKING CONTROLLER FOR A DC MOTOR

Michimasa Horiuchi, Mito, and Hiroshi Narita, Katsuta, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 28, 1973, Ser. No. 392,296
Claims priority, application Japan, Aug. 30, 1972, 47-86216
Int. Cl.² H02P *3/14*
U.S. Cl. 318—376 **8 Claims**

1. A regenerative braking controller for use with a DC motor, comprising a series-connected circuit including an armature of the DC motor, a field winding thereof and a smoothing reactor; a thyristor chopper connected in parallel with said series-circuit and including at least a main thyristor and a commutation thyristor for turning off said main thyristor; a diode connected between said parallel circuit and a power supply; and a gate controller means for applying a gate signal to the gate of said main thyristor continuously during

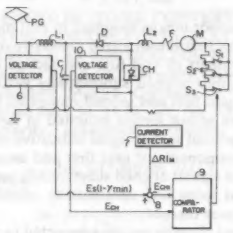


the period of time when said chopper is to be conductive and applying a pulse signal to the gate of said commutation thyristor at the end of said period of time.

3,947,740
REGENERATIVE BRAKE CONTROL SYSTEM FOR DC MOTOR

Takashi Tsuboi, Katsuta, Japan, assignor to Hitachi, Ltd., Japan

Filed Oct. 10, 1974, Ser. No. 513,773
Claims priority, application Japan, Oct. 12, 1973, 48-113947
Int. Cl.² H02P *3/12*
U.S. Cl. 318—376 **11 Claims**



1. A regenerative brake control system for a DC motor comprising: a DC motor; resistor means connected in series with said DC motor and including at least one resistor section; switch means for short-circuiting said resistor section of said resistor means; circuit means through which regenerative current is passed for regenerative braking by returning power generated by said DC motor to a power supply; chopper means, connected in parallel to a series circuit of said DC motor and said resistor means, for controlling the armature current of said DC motor by on-off operation thereof; means for controlling the duty cycle of said chopper means; and means for controlling the operation of said switch means in a manner so that the duty cycle immediately following the short-circuiting of said resistor section of said resistor means is a minimum value tolerable to said chopper means.

3,947,741
BOAT GUIDANCE SYSTEM

Kenneth H. Ball, Tarzana, and Arthur L. Cole, Jr., Saugus, both of Calif., assignors to Walt Disney Productions, Burbank, Calif.

Filed Jan. 15, 1974, Ser. No. 433,505
Int. Cl.² B63H *25/02*; **G05D** *1/00*; **B64C** *13/18*
U.S. Cl. 318—588 **10 Claims**

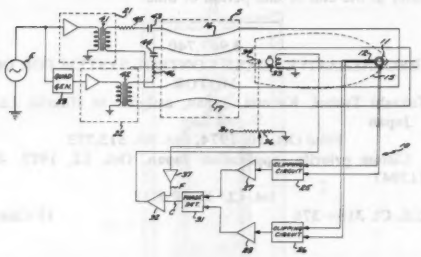
1. A guidance system for controlling the lateral motion of a mobile object along a directed path, comprising:

a source of A.C. electrical power;

first signal producing means operatively connected across said source of A.C. power, including a first conductor arranged in circuit to form a first elongated loop in a plane parallel with the surface of the path, for producing a first electromagnetic field signal thereabout according to the excitation thereof by said source of A.C. power;

phase lag means operatively connected at one end thereof across the said source of A.C. power for producing an A.C. excitation signal at the other end thereof at a predetermined phase relationship with said source of A.C. power;

second signal producing means operatively connected across said phase lag means, including a second conductor arranged in circuit to form a second elongated loop disposed in substantial parallel arrangement and partly overlapping said first elongated loop, for producing a second electromagnetic field thereabout according to the excitation of said phase lag means;



first inductive sensor means mounted in said mobile object for producing a first sensor signal indicative of the sum of vector components of said first and second electromagnetic field signals aligned substantially vertical relative the plane of said first and second elongated loops;

second inductive sensor means mounted in said object for producing a second sensor signal indicative of the sum of the vector components of said first and second electromagnetic field signals aligned substantially parallel to the planes of said loops and substantially transverse to the longitudinal axes thereof;

a first and second clipping means connected to respectively receive said first and second sensor signals for producing corresponding first and second square wave signals of fixed amplitudes respectively indicative of the zero crossings of said first and second sensor signals;

phase detector means adapted to receive said first and second square wave signals for producing a control signal indicative of the phase difference therebetween; and

control means rendered responsive to said control signal for producing control forces directing the motion of said mobile object in response thereto.

3,947,742

METHOD OF CONTROLLING AN ELECTRIC MOTOR

Paul Antonius Ferdinand van Acker, Rijswijk, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

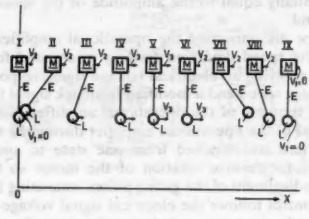
Filed Sept. 27, 1971, Ser. No. 183,830

Claims priority, application Netherlands, Sept. 30, 1970, 7014339

Int. Cl.² G05B 5/01

U.S. Cl. 318—611 **9 Claims**

1. A method of controlling a motor coupled to a load in an elastic subcritically damped manner wherein a speed variation is effected in at least one velocity step made up of two stages and comprising, bringing the motor from a first speed to a second speed during the first stage of said step whereupon the load initially persists in its initial movement and then moves towards its equilibrium position relative to the motor, and bringing the motor from the second speed to a third speed at a time during the second stage of said step such that the third



speed is reached when the load reaches the said equilibrium position for the first time, the speed difference between the motor and the load then being substantially equal to zero.

3,947,743

ELECTRIC CHARGER

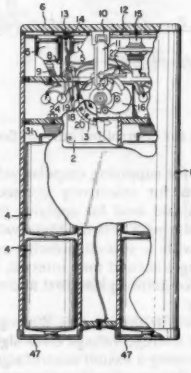
Kenichi Mabuchi; Kojiro Komatsu, both of Tokyo, and Yoshihisa Tsuchimochi, Ichikawa, all of Japan, assignors to Mabuchi Motor Co. Ltd., Tokyo, Japan

Filed Apr. 11, 1974, Ser. No. 460,070

Claims priority, application Japan, Apr. 13, 1973, 48-41859

Int. Cl.² H02J 7/00

U.S. Cl. 320—2 **14 Claims**



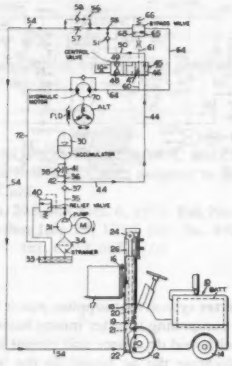
1. An automatic electric charger for charging small-sized batteries, which comprises: an inner power source battery capable of producing a higher voltage than the small-sized battery to be charged; a casing; at least one pocket in said casing for accomodating said battery to be charged; a timer; a motor driving said timer; a cam mechanism driven by said timer; graduated dial means for presetting said timer; a timing cycle circuit including said inner power source battery and said motor during which said inner power source battery drives said motor for a predetermined fixed total cycle period; a predischarging cycle circuit which is operative for a predetermined fixed time period of said timer upon actuation of said timer; and a charging cycle circuit which is operative for a predetermined variable time period of said timer upon termination of said discharging time period for effecting the charging operation on said battery said predetermined fixed total cycle period being at least equal to the combination of said discharging time period and said charging time period.

3,947,744

ELECTRIC TRUCK HAVING ELEVATED LOAD POTENTIAL ENERGY RECOVERY WITH MEANS TO ADJUST RATE OF CARRIAGE DESCENT

Michael H. Grace, Griffith, Ind., and Arvin Karazija, Oak Forest, Ill., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Oct. 21, 1974, Ser. No. 516,809
Int. Cl.² H02J 7/00
U.S. Cl. 320—61 14 Claims



1. In combination with an electric lift truck energized from an electric battery to supply pressurized fluid to a lift ram which elevates a load supporting carriage, an energy recovery system for converting the kinetic energy of said elevated carriage into battery charging current comprising

a fluid motor,

means for directing fluid exhausted from said lift ram through said fluid motor when said carriage is descending,

unidirectional current generating means for charging said battery including a rotatable generator driven by said fluid motor and having a field winding, and

means for selectively controlling the rate of descent of said carriage comprising transistor means for energizing said field winding to regeneratively brake said rotatable generator and said fluid motor which drives it during descent of said carriage and means for selectively varying the base drive of said transistor means to thereby regulate field excitation and the degree of regenerative braking.

3,947,745

VARIABLE VOLTAGE INVERTER

James E. Redmon, Fremont, Nebr., assignor to Agricultural Enterprises, Inc., Fremont, Nebr.

Filed Feb. 28, 1974, Ser. No. 446,659
Int. Cl.² H02M 3/22
U.S. Cl. 321—2 5 Claims

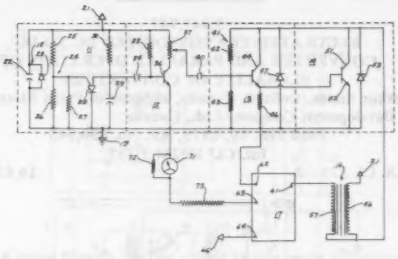
1. A variable voltage inverter comprising:

a source of D.C. voltage;

a relaxation oscillator means connected to said source for receiving and converting the D.C. voltage signal to a first A.C. voltage signal, said relaxation oscillator means including a programmable unijunction transistor;

a first transistor amplifying means for receiving said first A.C. voltage signal and providing a second A.C. voltage signal, said first amplifying means having a resistor and a first capacitor forming an RC-coupling to said oscillator means, said first amplifying means including a potentiometer means for selecting and transmitting a variable portion of said second A.C. voltage signal, said first amplifying means having a second capacitor connected to said potentiometer means;

a second transistor amplifying means connected by said second capacitor to said first amplifying means and actuated by said variable portion of said second A.C. voltage signal whereby said second amplifying means is switched



alternately between conducting and non-conducting states;

a transformer means connected to said second amplifying means; and

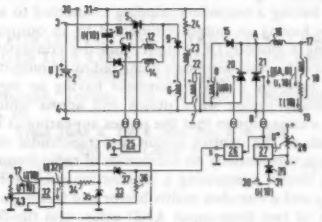
a voltage multiplier means for producing a stepped-up D.C. voltage signal from an input A.C. signal, said multiplier means being coupled to said transformer means, whereby a variable D.C. voltage output is obtained.

3,947,746

SINGLE-ENDED DC-TO-DC CONVERTER FOR THE PULSE CONTROL OF THE VOLTAGE AT AN INDUCTIVE LOAD AS WELL AS METHOD FOR ITS OPERATION

Harald Heinicke, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Dec. 30, 1974, Ser. No. 537,374
Claims priority, application Germany, Jan. 14, 1974, 2401596
Int. Cl.² H02M 3/315
U.S. Cl. 321—2 23 Claims



1. A single-ended dc-to-dc converter for use with a d-c voltage source and for providing pulse control of the voltage at an inductive load comprising:

a transformer including primary, secondary and magnetization reversal windings;

switch means for connecting said primary winding to said voltage source;

a first circuit means for connecting said secondary winding to said load, said first circuit means including a series valve connected to a choke;

limiting resistor means for connecting said magnetization winding to said voltage source such that the magnetization reversal current which flows through said magnetization reversal winding magnetizes the magnetic core of said transformer in the opposite direction as the primary current in said primary winding;

a first controlled by-pass valve connected in shunt with a first series circuit comprising said series valve and said secondary winding;

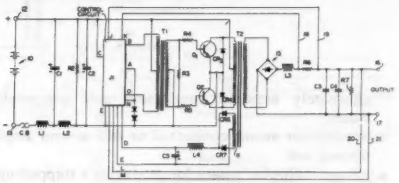
and a second by-pass valve connected in shunt with a second series circuit comprising said choke and said load, said second by-pass valve being poled in the direction of the current in said load.

3,947,747

REGULATED TRANSISTORIZED DC TO DC CONVERTER AND PARALLEL OPERATION OF PLURALITY OF CONVERTERS

Arthur Smith, Dollard, Canada, assignor to Pylon Electronic Development Company Ltd., Canada

Filed Feb. 19, 1975, Ser. No. 550,945
Int. Cl.² H02M 3/335
U.S. Cl. 321—2 **16 Claims**



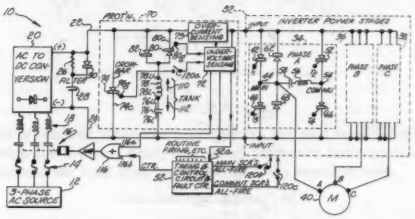
1. A DC to DC converter comprising a control circuit energizable by a source of DC current and having a first pair of output terminals connected in series with said source of DC current and one half of a center-tapped primary winding of a first transformer and a second pair of output terminals connected in series with said source of DC current and the other half of said center-tapped primary winding, said control circuit producing pulses alternately in the two halves of the center-tapped primary winding, said first transformer having a center-tapped secondary winding with each half of said secondary winding being connected to electronic switching means for causing pulses of current to flow from said source of DC current alternately in two halves of a center-tapped primary winding of a second transformer, said second transformer having a secondary winding connected to a full wave rectifier having an output connected to an output filter for providing a smooth DC output from the converter, each of said pairs of output terminals being fed by an output transistor fed, in turn, by a driver transistor having an input fed by substantially square wave pulses and across which is connected a capacitor so that the pulses appearing at the output terminals of the control circuit are trapezoidal shaped and thus have substantially no harmonics of radio frequency, said control circuit comprising a unijunction oscillator driving a flip-flop and a one-shot multivibrator and feeding a first input of each of two three-input AND gates, said flip-flop having one output feeding a second input of one of said AND gates and a second output feeding a second input of the other of said AND gates and said one-shot multivibrator having a pulse output feeding a third input of each of said AND gates, each AND gate being associated with a different one of the pairs of outputs of the control circuit and, when enabled, resulting in current flow from its associated pair of output terminals, said converter further comprising feedback means responsive to current flow in the output of the converter for regulating the pulse duration of the one-shot multivibrator and hence the duration of time that the AND gates are enabled, said unijunction oscillator comprising a programmable unijunction transistor and said control circuit comprising a sync. frequency line, means responsive to firing of the programmable unijunction transistor for producing a pulse on the sync. frequency line and means responsive to reception of a pulse on the sync. frequency line for firing the programmable unijunction transistor.

3,947,748

FAULT COMMUTATION SYSTEM FOR STATIC INVERTERS

Frank Nicholas Klein, Kenosha, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Feb. 18, 1975, Ser. No. 544,169
Int. Cl.² H02M 1/18
U.S. Cl. 321—11 **20 Claims**



1. An inverter system that supplies power to an ac load from a dc source comprising inverter means having input terminals connected with said dc source and output terminals connectable for delivering the ac power to the load and having a plurality of inverter semiconductor means each periodically rendered conductive and non-conductive, sensing means for sensing a fault in which at least some of said inverter semiconductor means experience a current overload and for producing a fault indication signal, first switching circuit means connected with said fault sensor and responsive to said fault indication signal and connected for diverting thereupon at least a portion of current from said overloaded inverter semiconductor means, capacitance means for storing electrical energy, means for charging said capacitance means to a first polarity, inductance means for storing electrical energy and connected in series with said capacitance means, second switching circuit means connected in series with said capacitance means and said inductance means for blocking and unblocking current flow therethrough, the series circuit of said capacitance means, inductance means and second switching circuit means being connected in parallel with said dc source, said second switching circuit means being responsive to said fault indication signal not earlier than said current portion is diverted to discharge said capacitance means by current flow through said second switching means and said inductance means and to recharge said capacitance means with polarity opposite from said first polarity, said capacitance means being connected with said inverter input terminals so as to apply said opposite polarity to said inverter input terminals, whereby an attempt is made to interrupt said fault.

3,947,749

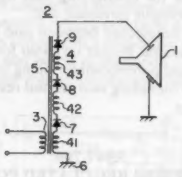
APPARATUS FOR GENERATING HIGH VOLTAGE FOR CATHODE-RAY TUBE

Isamu Kimura, and Takumi Hayashi, both of Yokohama, Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 31, 1975, Ser. No. 546,124
Int. Cl.² H02M 7/10
U.S. Cl. 321—47 **12 Claims**

1. An apparatus for generating a high voltage for the cathode-ray tube comprising a primary winding, a secondary winding divided into a plurality of winding units by a plurality of diodes, and means for tuning said plurality of winding units to at least two high harmonics of different odd-numbered orders including the fifth-order harmonics and another high harmon-

ics of a different order by differentiating the winding density distribution of said primary winding on the one hand and the



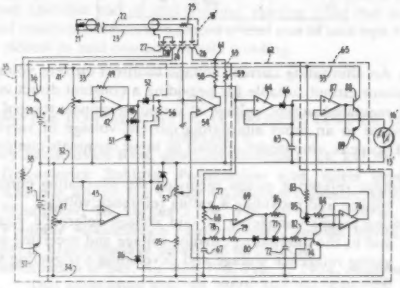
number of turns of each of said winding units of said secondary winding on the other.

3,947,750

DUAL FUNCTION ELECTRONIC CIRCUIT

Herbert F. Nichols, San Jose, Calif., assignor to Joel Bauman, San Francisco, Calif.

Division of Ser. No. 295,448, Oct. 6, 1972, Pat. No. 3,851,528. This application July 29, 1974, Ser. No. 492,687
Int. Cl.² G05F *1/10*
U.S. Cl. 323—1 **2 Claims**



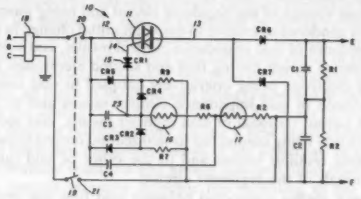
1. An electronic circuit for maintaining constant current flow to an electrical component and amplifying changes in voltage across said component comprising a feedback operational amplifier having an output terminal, an inverting input terminal and an non-inverting input terminal; a feedback path including said electrical component connected from said output terminal to said inverting input terminal for maintaining the potential at said inverting input terminal at essentially the same potential at said non-inverting input terminal; means for applying an essentially constant potential to said non-inverting input terminal of said amplifier; resistance means, separate from said feedback path, connected between a generally constant potential source and said inverting input terminal to thereby provide a source of constant current flow through said component and said feedback path; said component being further connected to said output terminal of said amplifier through a first one of a pair of resistances, the second one of said pair of resistances being connected between the amplifier output terminal side of said component and a generally constant potential source to cause current variations in said first resistance which are proportional to potential variations at the amplifier output terminal side of said component and any voltage changes at said output terminal of said amplifier are proportional to but greater than voltage changes at the output terminal side of said component, and whereby both constant current flow through said component and voltage amplification is obtained with a single operational amplifier.

3,947,751

ELECTRONIC VARIAC SURGE CURRENT LIMITING CIRCUIT

William Edward Bray, Houston, Tex., assignor to Texas Instrument Inc., Dallas, Tex.

Filed June 24, 1974, Ser. No. 482,388
Int. Cl.² G05F *1/10*
U.S. Cl. 323—9 **11 Claims**



1. A surge current limiting circuit having input and output means, for connection to a source of alternating current input comprising:

a. gated symmetrical switch means, having a first and second main electrode and a gate control electrode, the first main electrode being operatively connected to the input means and the second main electrode being operatively connected to the output means;

b. threshold voltage means having an input, and an output connected to the control electrode for providing a voltage to the control electrode when a prescribed voltage is reached, either positive or negative; and

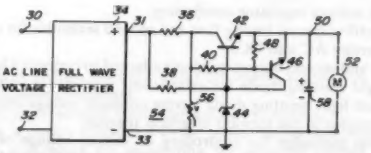
c. variable voltage ramp means having an output connected to the input of the threshold voltage means and an input connected to receive the alternating current, including an RC circuit wherein at least part of the resistance is of the negative temperature coefficient type for incrementally decreasing the time required for the ramp voltage to reach the prescribed voltage, and including a diode bridge circuit operatively connected to discharge the capacitance of the RC circuit during the first half of each half cycle of the alternating current input.

3,947,752

CIRCUIT FOR CONVERTING ALTERNATING CURRENT VOLTAGES TO A CONSTANT MAGNITUDE DIRECT CURRENT VOLTAGE

Jack R. Morgan, Tempe, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed June 4, 1974, Ser. No. 476,180
Int. Cl.² G05F *1/56*
U.S. Cl. 323—17 **12 Claims**



1. A regulator circuit for providing a direct current output voltage of a predetermined magnitude at output terminals thereof in response to applied alternating current input power, the input power having peak amplitudes which vary in magnitude, the regulator circuit comprising:

rectifier means responsive to said applied input power for deriving unidirectional power across first and second output terminals thereof;

impedance control means having first, second and control electrodes for changing the magnitude of the impedance developed across said first and second electrodes thereof, said first electrode being connected to one of said output terminals of the regulator circuit;

first resistive means interposed between said first output terminal of said rectifier means and said second electrode of said impedance control means;

voltage reference means for sensing the magnitude of the output voltage of the regulator circuit and being momentarily rendered operative to cause an initial change in said impedance of said impedance control means, said voltage reference means having first and second electrodes, said first electrode being operatively coupled to said control electrode of said impedance control means and to said first output terminal of said rectifier means, said second electrode being connected to said second output terminal of said rectifier means and to the other of said output terminals of the regulator circuit;

feedback means connected between said first and second electrodes of said impedance control means and having an output terminal for providing a feedback signal in response to said impedance change of said impedance control means; and

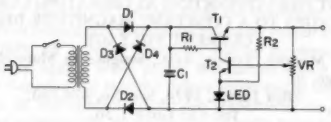
switching means responsive to said feedback signal for regeneratively increasing the rate of impedance change of said impedance control means in response to said initial impedance change, said switching means being operatively coupled between said output terminal of said feedback means, said first electrode of said impedance control means and said first electrode of said voltage reference means.

3,947,753

VOLTAGE REGULATOR INCLUDING AN LED TO PROVIDE A REFERENCE VOLTAGE

Hideki Gushima, Kodaira; Matsutoshi Ito, Narashino, and Junichi Ishiwata, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 356,205, May 1, 1973, abandoned. This application July 18, 1974, Ser. No. 489,844
Claims priority, application Japan, May 6, 1972, 47-48697
Int. Cl.² G05F *1/56*
U.S. Cl. 323—21 **7 Claims**



7. A voltage regulator comprising:

a rectifier circuit having first and second terminals for converting AC into DC;

first and second output terminals adapted to connect a load;

a light emitting diode for establishing a reference voltage; said light emitting diode having constant voltage characteristics in the forward direction thereof;

a first transistor for controlling an output voltage of the voltage regulator, the collector-emitter circuit of said first transistor being connected between said first terminal and said first output terminal;

a second transistor for detecting the difference between the output voltage and the reference voltage, the collector-emitter circuit of said second transistor being connected between the base of said first transistor and the anode of said light emitting diode, and the base of said second transistor being connected to the center tap of said potentiometer;

a first resistor for establishing a biasing voltage for said first and second transistors, said first resistor being connected between the collector and base of said first transistor;

a second resistor for connecting said light emitting diode and said first output terminal; and

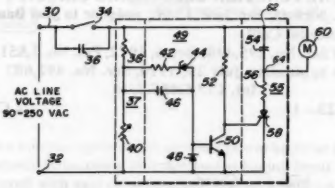
a potentiometer connected between said first output terminal and said second output terminal for dividing the output voltage, said potentiometer being connected in parallel with a path including said second resistor and said light emitting diode.

3,947,754

OPEN LOOP SERIES REGULATED POWER SUPPLY

Reuben Wechsler, Phoenix, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed June 3, 1974, Ser. No. 475,736
Int. Cl.² G05F *1/56*
U.S. Cl. 323—22 SC **14 Claims**



1. An alternating current voltage to direct current voltage regulator circuit suitable for providing a constant direct current regulated output voltage at output terminals thereof in response to an input alternating current voltage of varying peak-to-peak amplitudes applied to input terminals comprising:

voltage reference means receiving the alternating current voltage and providing a gating reference voltage;

gating means connected to said voltage reference means and to the alternating current voltage and receiving said gating reference voltage and developing a triggering signal;

regulator means connected to said gating means and receiving said triggering signal and the alternating current voltage for deriving a regulated and constant direct current voltage at said output terminals thereof;

said triggering signal occuring at substantially a constant magnitude of said alternating circuit voltage.

3,947,755

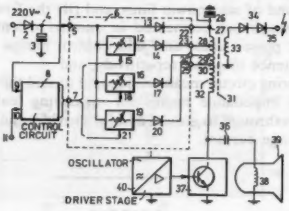
CIRCUIT FOR STABILIZING THE OPERATING VOLTAGE OF A SWEEP CIRCUIT FOR A CATHODE-RAY TUBE

Otto Daute, Landau, Pfalz, Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt, Germany

Filed Aug. 5, 1974, Ser. No. 494,857
Claims priority, application Germany, Aug. 9, 1973, 2340286
Int. Cl.² G05F *1/20*; H01J *29/70*
U.S. Cl. 323—43.5 S **13 Claims**

1. In a system for producing sweep voltages for deflecting the beam of a cathode-ray tube, which system includes an operating voltage source whose output voltage is subject to amplitude variations, an output transformer having a winding, with one end of the winding being normally connected to the voltage source, a capacitor connecting the one end of the winding to a point of common potential for the system, a plurality of voltage-applying taps connected to the transformer at respectively different distances from the one end of the winding, and a circuit for connecting the operating voltage source to different ones of the taps, depending on the operat-

ing voltage amplitude, in order to stabilize the voltage across the transformer, the improvement wherein said circuit comprises: a plurality of electronically controllable variable resistance means each connected between said operating voltage source and a respective one of said taps; a plurality of diodes, each connected in series with a respective one of said variable resistance means and poled to be conductive in the direction of flow of the sweep voltage-producing operating current; and



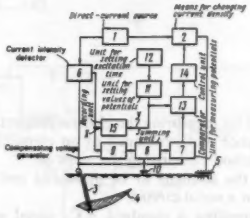
control means connected to control the conductive states of said variable resistance means, as a function of the amplitude of the operating voltage, in a manner such that upon the occurrence of successively lower operating voltage amplitude values, successive ones of said resistance means are rendered conductive in the order of the distance of their respective taps from said one end of said winding, starting from that one of said resistance means connected to that one of said taps which is closest to said one end of said winding.

3,947,756

DEVICE FOR GEOPHYSICAL PROSPECTING OF ORE DEPOSITS

Jury Samuilovich Ryss, prospekt Shvernika, 14, kv. 39; Jury Grigorievich Bakhtin, Pushkinskoe o/m, ulitsa generala Khazova, 45, kv. 66; Viktor Nikolaevich Chamaev, prospekt Metallistov, 78, korpus 2, kv. 370, all of Leningrad, and Vladimir Mikhailovich Panteleimonov, poselok Revda, 10, kv. 5, Murmanskaya oblast, all of U.S.S.R.

Continuation of Ser. No. 438,776, Feb. 1, 1974, abandoned.
This application Feb. 10, 1975, Ser. No. 548,733
Int. Cl.² G01V *3/04*
U.S. Cl. 324—1 **5 Claims**



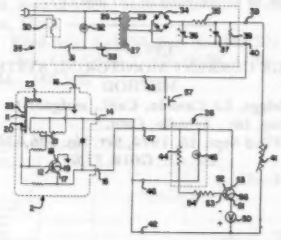
1. A device for geophysical prospecting of ore deposits, comprising, in combination: a direct-current source provided with a means for changing the intensity of a current which excites electrochemical reactions on the surface of an ore body; a current intensity detector having an input connected to said direct current source; a main current-carrying electrode having electrical contact with the ore body and connected to said direct current source via said current intensity detector; an auxiliary current-carrying electrode having electrical contact with a medium enclosing the ore body and also connected to said direct current source via said means for changing the intensity of the current; a compensating voltage generator having an input connected to said current intensity detector, a summing unit with one input connected to the output of said compensating voltage generator; a first unit having a plurality of inputs for measuring the potentials of electrochemical reactions on the surface of the ore body, one input thereof being connected to the output of said summing unit and another input connected to said main current-carrying electrode; a measuring electrode connected to said summing unit and responsive to the electric potential difference with respect to said main current-carrying electrode; a second unit for setting the time of excitation by direct current of the ore body to effect programmed modes of investigating electrochemical processes; a third unit for setting values of the potentials of the electrochemical reactions on the surface of the ore body, an input at the third unit being connected to said second unit for setting the time of excitation by direct current of the ore body; a recording unit having a first input connected to said third unit for setting values of the potentials of said electrochemical reactions and having a second input connected to the current intensity detector for recording in the form of polarization curves the relationships between the set potentials of the electrochemical reactions on the surface of the ore body and the currents flowing through the surface of that body which account for the potentials; a comparator to compare voltages applied from said third unit for setting values of the potentials of said electrochemical reactions, connected whereto is one input of said comparator, and from said first unit for measuring the potentials of the electrochemical reactions on the surface of the ore body, connected whereto is another input of said comparator; a control unit with an input connected to the output of said comparator, its output being connected to said means for changing current intensity, said later means causing the intensity of the current flowing through the circuit of said current-carrying electrodes to increase or decrease.

3,947,757

VOLTAGE REGULATOR TESTER

Donald B. Grube; Juan C. Grube, and James A. Grube, all of 1220 E. 58th Hwy., Raymore, Mo. 64083

Filed Feb. 24, 1975, Ser. No. 552,441
Int. Cl.² G01R *31/02*
U.S. Cl. 324—28 R **11 Claims**



1. A voltage regulator tester for testing automotive voltage regulators comprising:

a. an adjustable direct current power source;

b. a circuit connected to the power source and including a volt-meter for monitoring the adjusted voltage output level of said power source, said circuit having terminals connecting a voltage regulator to be tested thereto;

c. a test load in the circuit for simulating the field coil of an automotive alternator with which a voltage regulator to be tested is normally used;

d. a lamp in the circuit for indicating the presence of electrical current in said test load when energized; and

e. automatic switching means in the circuit to connect said volt-meter to said test load when said regulator is supplying electrical current thereto and to disconnect said volt-

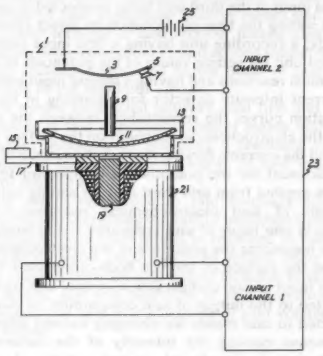
meter when the supply of current to said test load is interrupted by the voltage regulator.

3,947,758

DISC THERMOSTAT TEST SYSTEM AND METHOD

Walter T. Sutton, Lexington, Ky., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 317,481, Dec. 21, 1972, abandoned.
This application May 14, 1974, Ser. No. 469,721
Int. Cl.² G01R 31/02
U.S. Cl. 324—28 R **13 Claims**



1. A method of testing and adjusting a thermostat having a snap acting disc displaying magnetic properties, a switch and a transfer pin urged by said disc to operate said switch, comprising the steps of

a. providing a velocity graph on electronic storage means with respect to time for said disc during snapping thereof,

b. providing a graph on electronic storage means with respect to time of switch operation of said thermostat during snapping of said disc, and

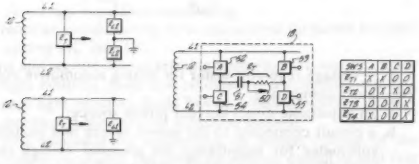
c. adjusting the operation of said switch relative to time in response to said graphs in (a) and (b).

3,947,759

LEAKAGE CURRENT MONITORING SYSTEM AND METHOD

James B. Briggs, La Canada, Calif., assignor to Continental Engineering, Inc., Arcadia, Calif.

Filed Sept. 16, 1974, Ser. No. 506,434
Int. Cl.² G01R 31/02
U.S. Cl. 324—51 **18 Claims**



1. A system for monitoring leakage current to ground in a power system having a pair of power lines, comprising

impedance means for connection to said power lines, said impedance means having first and second terminals and a third intermediate terminal,

switching means coupled to said power lines and to the first and second terminals of said impedance means for connecting said impedance means in predetermined configurations to one or both of said power lines,

control means coupled to said switching means for providing four sampling periods and for causing said switching means to each assume a given state in sequence for, in turn, causing said impedance means to be connected in four different configurations to said power lines wherein (a) the first and second terminals are connected to the first of said power lines, (b) the first and second terminals are connected in one orientation across said power lines, (c) the first and second terminals are connected to the second of said power lines, and (d) the first and second terminals are connected in another orientation across said power lines, and said control means causing said sequence to occur repetitively, and

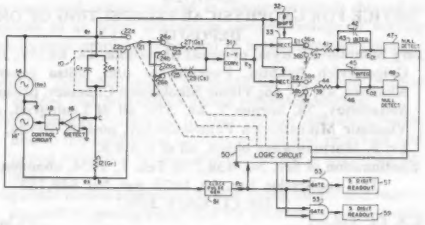
measuring circuit means connected to said third terminal of said impedance means for measuring leakage current therethrough to ground and for providing an indication of leakage current.

3,947,760

INTEGRATING COMPONENT MEASURING DEVICE

Hitoshi Noguchi, Hachioji; Kohichi Maeda, Tachikawa, and Takeshi Kyo, Hachioji, all of Japan, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 415,855, Nov. 14, 1973, abandoned.
This application Jan. 3, 1975, Ser. No. 538,496
Int. Cl.² G01R 27/00
U.S. Cl. 324—57 R **6 Claims**



1. A method for measuring the electric properties of capacitance, inductance and resistance of an element to be measured, said method comprising the steps of:

connecting the element to be measured and a reference element in a serial circuit;

serially connecting a standard A.C. signal source and a variable A.C. signal source to the serial circuit;

controlling said variable signal source to null at least one of a junction voltage and a junction current produced at the common junction of the element to be measured and the reference element;

alternately coupling the A.C. signals to a standard circuit to generate a signal proportional to the element values of the standard circuit;

synchronously rectifying the signal proportional to the element values of the standard circuit;

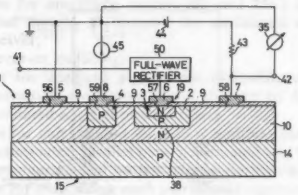
charging and discharging an integrating capacitor in proportion to said rectified signals; and

measuring an electrical property component of said element to be measured by counting the ratio of the charging and the discharging times of the integrating capacitor.

3,947,761
PEAK LEVEL INDICATOR

Michio Arai, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 373,731, June 26, 1973, Pat. No. 3,868,718. This application Aug. 21, 1974, Ser. No. 499,264
Claims priority, application Japan, Aug. 25, 1973, 48-95389
Int. Cl.² G01R 19/16; H01L 11/00
U.S. Cl. 324—103 P 13 Claims

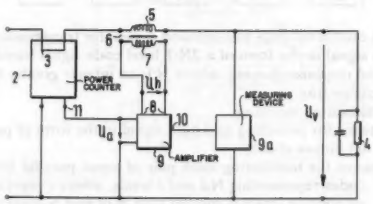


1. A peak level indicator comprising:
a. a charge storage semiconductor device including a semiconductive substrate with a current path portion, first and second semiconductive regions forming a PN junction therebetween, said first region being capacitively coupled to said current path portion, and a control electrode connected to said second region;
b. means for applying a current through said current path portion;
c. an indicating means for indicating said current through said current path portion; and
d. means for applying an input signal to said control electrode.

3,947,762
PROCESS AND APPARATUS FOR MEASURING THE APPARENT POWER FED TO AN ALTERNATING CURRENT CONSUMER

Alfred Hug, Illnau, Switzerland, assignor to Hug Interlizenz AG, Switzerland

Filed June 18, 1974, Ser. No. 480,375
Claims priority, application Switzerland, June 21, 1973, 9072/73
Int. Cl.² G01R 21/00
U.S. Cl. 324—142 13 Claims

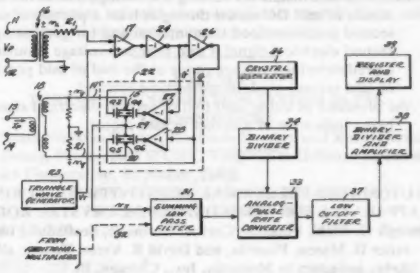


13. A method of measuring the apparent power fed to an alternating current consumer, said method comprising connecting a current path carrying the consumer current through an active power measuring device, inducing an auxiliary voltage from said current path which is in phase with the consumer current and is of constant value, continuously adjusting said auxiliary voltage in accordance with the instantaneous value of the consumer voltage, and applying the adjusted voltage to the power measuring device so that the output of said power measuring device is a product of said consumer current and the adjusted auxiliary voltage.

3,947,763
C-MOS ELECTRONIC KWH METER AND METHOD FOR METERING ELECTRICAL ENERGY

Miran Milkovic, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 30, 1974, Ser. No. 474,519
Int. Cl.² G01R 7/00, 11/32
U.S. Cl. 324—142 14 Claims

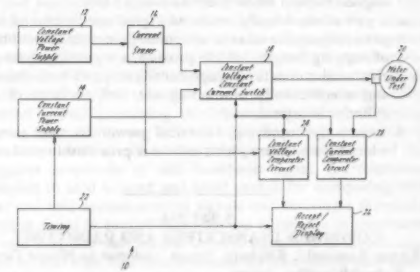


1. A method for metering electrical energy in a system comprising the steps of generating a first and a second analog signal, one of the first and second signals being proportional to a voltage and the other of the first and second analog signals being proportional to a current, generating a cyclically varying reference signal, comparing one of the first and second analog signals to the cyclically varying reference signal to generate a pulse train which is width-modulated in accordance with the comparison, coupling the other of the analog signals through a bipolar switch with the actuation of the bipolar switch being controlled by the width-modulated pulse train so that an output pulse train is formed at the bipolar switch output which is width-modulated in accordance with one of the analog signals and amplitude-modulated in accordance with the other of the analog signals.

3,947,764
METHOD AND APPARATUS FOR TESTING DC MOTORS

Edward H. Abbott, Ann Arbor, and Robert L. Johnstone, Plymouth, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 5, 1974, Ser. No. 489,276
Int. Cl.² G01R 31/00; H02K 11/00
U.S. Cl. 324—158 MG 10 Claims



1. Apparatus for testing a DC motor which comprises:
a constant voltage source of DC electrical energy;
a constant current source of DC electrical energy;
first circuit means for connecting said constant voltage source to said DC motor for a first predetermined time interval;
second circuit means for sensing the magnitude of current flow through said DC motor when it is connected to said

constant voltage source and for generating a first electrical signal if said current magnitude falls below a predetermined level during at least a portion of said first predetermined time interval;

third circuit means for connecting said constant current source to said DC motor to cause a constant current to flow through said DC motor for a second predetermined time interval; and

fourth circuit means for sensing the voltage across the terminals of said DC motor during at least a portion of said second predetermined time interval and for generating a second electrical signal if said terminal voltage is outside a predetermined voltage range at the end of said portion of said second predetermined time interval;

the presence of either said first or second electrical signals being indicative of a defect in said motor.

3,947,765

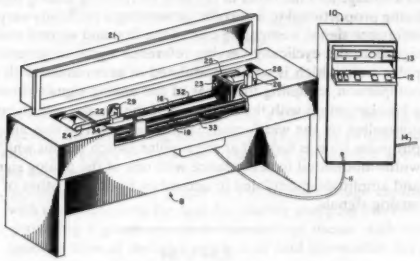
AUTOMATED ELECTRICAL RESISTIVITY MEASURING APPARATUS FOR SEMICONDUCTOR CRYSTAL RODS

Joseph O. Diehl, Phoenix; Carl A. Germano, Scottsdale; Lawrence D. Mason, Phoenix, and David R. Veres, Tempe, all of Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed Jan. 30, 1975, Ser. No. 545,648

Int. Cl.² G01R *27/02, 27/08*

U.S. Cl. 324—158 R **6 Claims**



5. A semiconductor crystal resistivity measuring station comprising:

a. a housing having a cover;

b. a pair of electrically insulated rails forming a trough within said housing and beneath said cover whereby a cylindrically shaped crystal is caused to be centrally self aligned therein when placed on said rails;

c. a pair of electrically insulated crystal specimen end supports, adjustable so as to accommodate crystal specimens of varying length, which provide a mounting base for electrical contacts of a high density screen for electrically and mechanically contacting the end surfaces of the cylindrical crystal; and

d. means for applying electrical power to said screens whereby a uniform electric field is provided in said crystal.

3,947,766

COMBINED TRANSCEIVER AND RADIO UNIT

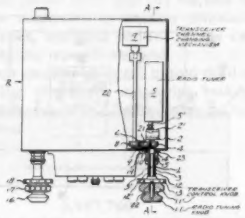
Kazuo Kawasaki, Kitakata, Japan, assignor to Nissan Denshi Kabushikigaisha, Japan

Filed Dec. 16, 1974, Ser. No. 533,004

Int. Cl.² H03J *5/00;* **H04B** *1/40*

U.S. Cl. 325—25 **3 Claims**

1. A combined transceiver and radio unit, incorporating a transceiver, having a channel changing mechanism, and a radio, having a radio tuner, enclosed in a common housing, having a front wall, for conjoint mounting, said unit comprising, in combination, a transceiver control shaft, having an inner end in operative connection with said channel changing mechanism, and an outer end; a first gear secured to said outer end of said control shaft; a tubular outer shaft extending through an opening in said front wall, and having inner and outer ends; a second gear secured to the inner end of said outer shaft and in driving connection with said first gear; an inner shaft, extending coaxially through said tubular shaft, having an inner end in operative connection with said radio tuner, and an outer end; respective control knobs secured to



the outer ends of said outer and inner shafts; a pair of levers having inner ends interconnected by a pivot and outer ends respectively pivoted on said transceiver control shaft and said outer shaft; and an idler gear freely rotatable on said pivot and meshing with said first and second gears to constitute said driving connection therebetween; said levers and said idler gear providing for relative displacement of said tubular outer shaft relative to said transceiver control shaft.

3,947,767

MULTILEVEL DATA TRANSMISSION SYSTEM

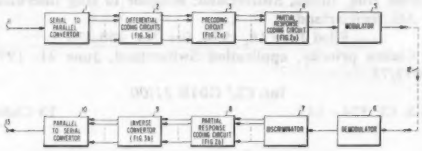
Shin'Ichi Koike, and Hiroshi Fujimoto, both of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Sept. 25, 1974, Ser. No. 509,171

Claims priority, application Japan, 48-108842

Int. Cl.² H04B *1/62*

U.S. Cl. 325—38 A **11 Claims**



1. A multilevel code transmission system for transmission of a data signal in the form of a **2N-1** level code signal based on a partial response shaping, where N is an integer greater than two, comprising:

a transmitter including

means for providing said data signal in the form of parallel binary codes;

means for monitoring each pair of input parallel binary codes representing N-*i* and *i* levels, where *i* represents all positive integers smaller than N of said N-level code signal, wherein each pair of input parallel binary codes is so arranged that only the most significant bit is different from each other and the remaining bits are represented by the same binary codes;

means for delivering an output parallel binary code representing *i* level when the level monitored by said monitoring means is N-*i* or *i* and the most significant bit last monitored by said monitoring means is a binary one, and for delivering another output parallel binary code representing N-*i* level when the level monitored by said monitoring means is N-*i* or *i* and the most significant bit last monitored by said monitoring means is a binary zero;

means for converting the outputs of said delivering means to said 2N-1 level code signal based on the partial response shaping, said converting means including an adder for carrying out modulo-N addition between the outputs of said delivering means and a delayed signal, a delay circuit for delaying the output of said adder by twice the clock time period for data transmission to deliver said delayed signal, and a subtractor for subtracting said delayed signal from the output of said adder to deliver said 2N-1 level code signal; and

means for amplitude modulating said 2N-1 level code signal thereby to transmit the modulated signal to a receiver;

and a receiver including

means for applying a coherent demodulation to said transmitted modulated signal thereby to deliver discriminated parallel binary codes;

means for carrying out modulo-N addition between said discriminated parallel binary codes and said N, thereby to regenerate said output parallel binary codes;

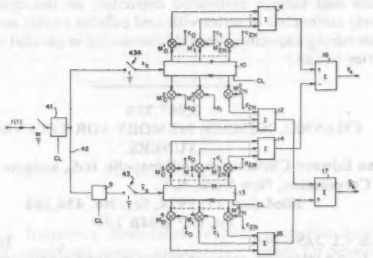
means for monitoring each pair of said regenerated input parallel binary codes; and

means for regenerating one of said parallel binary codes which represents *i*-level when the level monitored by the last mentioned monitoring means is N-*i* or *i* and is equal to the N-*i* or *i* level last monitored by the last mentioned monitoring means, and for regenerating another of said input parallel binary codes which represents N-*i* level when the level monitored by the last mentioned means is N-*i* or *i* and is different from the N-*i* or *i* level last monitored by said last mentioned monitoring means, thereby to regenerate said data signal in the form of parallel binary codes.

3,947,768
CARRIER-MODULATION DATA TRANSMISSION EQUALIZERS

Andre E. Desblache, Nice, France, and Thomas E. Stern, Riverdale, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 8, 1975, Ser. No. 539,493
Int. Cl.² H04B 3/04
U.S. Cl. 325—42 **11 Claims**



1. An equalization method for equalizing carrier modulated data signals transmitted through a transmission medium which introduces linear distortions into the transmitted signals, each equalization method including the steps of:

a. performing a phase transformation on the distorted received signal $r(t)$ to obtain a signal $\hat{r}(t)$ in which the frequency components are in phase quadrature with respect to those same components of the received signal $r(t)$;

b. performing a filtering operation on said signals $r(t)$ and $\hat{r}(t)$, to generate two signals $y(t)$ and $\hat{y}(t)$ representing the in phase and quadrature components of an equalized output signal, said signals being such that

$$y(t) = h_1(t) \times r(t) - h_2(t) \times \hat{r}(t)$$

$$\hat{y}(t) = h_1(t) \times \hat{r}(t) + h_2(t) \times r(t)$$

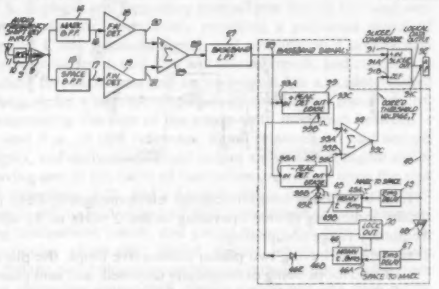
wherein x indicates a convolution operation and $h_1(t)$ and $h_2(t)$ are the filtering operation impulse responses of two filters, and

c. recovering information about the phase and amplitude modulation of said modulated data signals from said equalized signal components.

3,947,769
THRESHOLD CORRECTION SYSTEM IN FSK TRANSMISSIONS

William Nicholas Rousos, Hacienda Heights, and Robert Bruce Denny, Poway, both of Calif., assignors to Hoffman Electronics Corporation, El Monte, Calif.

Filed Oct. 23, 1974, Ser. No. 517,384
Int. Cl.² H04B 1/12; H04L 27/14
U.S. Cl. 325—320 **7 Claims**



1. In a radio receiving system which includes means for receiving two carrier waves that are subject to different fading in their transmission from a remote location, and means for deriving two sequential signals with each of said signals corresponding respectively to a corresponding one of said carrier waves, a variable threshold level detector comprising: first means responsive to said deriving means for producing a bipolar baseband signal which is representative of differences in amplitude for each respective sequwntial signal with positive amplitudes of said baseband signal being in accordance with one of said sequential signals and negative amplitudes of said baseband signal being in accordance with the other one of said sequential signals, second means coupled to said first means and comprising first control signal producing means and first conditioning means for conditioning said first control signal producing means to derive a first control signal representative of the positive amplitude of said baseband signal, third means coupled to said first means and comprising second control signal producing means and second conditioning means for conditioning said second control signal producing means to derive a second control signal representative of the negative amplitude of said baseband signal, fourth means coupled to said second and third means for comparing said first and said second control signals and deriving a threshold control signal in accordance with the difference in amplitude of said first and said second control signals, fifth means coupled to said first and fourth means for comparing said baseband signal and said threshold control signal and producing a data output signal, sixth means responsive to change in polarity of said data output signal from a negative amplitude to a positive amplitude to operate said first conditioning means, seventh means responsive to changes in polarity of said data output signal from a positive amplitude to a negative amplitude to operate said second conditioning means, said first and second control signal producing means after being conditioned by operation of their corresponding first and second conditioning means being thereafter receptive to

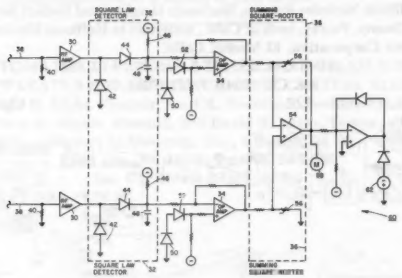
change in the corresponding postive and negative amplitude of said bipolar signal to correspondingly change said first and second control signals.

3,947,770

BROADBAND OMNIDIRECTIONAL RF FIELD INTENSITY INDICATING DEVICE

John F. Cavanagh; Dennis E. Vaught, and Hugh K. Wolfe, all of Dahlgren, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 12, 1974, Ser. No. 487,940
Int. Cl.² H04B 17/00
U.S. Cl. 325—363 **2 Claims**



1. A broadband omnidirectional electromagnetic-field intensity indicating device operating in the 2 MHz to 32 MHz frequency range comprising:

an antenna having two planar conductive loops, the planes of said loops being orthogonally disposed, and said planes intersecting to form an axis about which the loops are symmetrically disposed, wherein an incident electromagnetic field will generate a current in each of the loops;

two current transformers, one connected to each of the loops to convert the current therein to proportional voltage signals;

a square law detector;

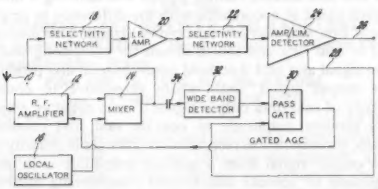
a summing square rooter, said square law detector and said summing square rooter combining the voltage signals to provide an output signal independent of the angle of arrival of and the frequency of the incident electromagnetic field, and representative of the total resultant intensity of the field; and, means for indicating the output signal.

3,947,771

KEYED CLASSICAL AGC SYSTEM

James E. Mathews, Kokomo; Wayne A. Smith, Russiaville, and Lester Wilkinson, Kokomo, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 21, 1975, Ser. No. 551,603
Int. Cl.² H04B 1/16
U.S. Cl. 325—404 **2 Claims**



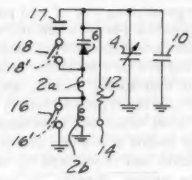
1. In a signal receiver having an RF amplifier stage, a local oscillator, a mixer stage responsive to the outputs of said RF amplifier and said local oscillator for effecting a frequency conversion of a received signal, and means responsive to the output of said mixer stage for developing a DC voltage related to on-channel signal strength, the improvement comprising gate means for developing, when enabled, an AGC voltage proportional to said DC voltage, level detector means responsive to the output of said mixer for enabling said gate means only when the output of said mixer stage exceeds a predetermined threshold level, and means for applying said AGC voltage to said RF amplifier stage to reduce the gain thereof.

3,947,772

AFC TUNING CIRCUIT

Shoji Sato, Soma, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Feb. 6, 1975, Ser. No. 547,385
Claims priority, application Japan, Feb. 15, 1974, 49-18296
Int. Cl.² H04B 1/16
U.S. Cl. 325—422 **3 Claims**



1. An AFC tuning circuit of the type having detection means for generating a voltage signal dependent upon the frequency drift of the circuit, said tuning circuit comprising a voltage controlled capacitor operably connected to said detection means and responsive to said voltage signal to vary the capacitance thereof, an AFC sensitivity determining capacitor conditionally connected in parallel to said voltage controlled capacitor, said voltage signal from said detection means being applied at the junction between said AFC sensitivity determining capacitor and said voltage controlled capacitor, means for disconnecting said AFC sensitivity determining capacitor from said voltage controlled capacitor, an inductor operatively connected in series with said parallel circuit and a variable tuning capacitor operably connected in parallel with said series circuit.

3,947,773

CHANNEL NUMBER MEMORY FOR TELEVISION TUNERS

Don Edward Christensen, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 17, 1974, Ser. No. 434,282
Int. Cl.² H04B 1/06
U.S. Cl. 325—464 **10 Claims**

1. In a television receiver having means for providing digital signals representative of a channel number, a system for storing said channel number comprising:

input means for receiving digital signals representative of individual digits of a television channel number;

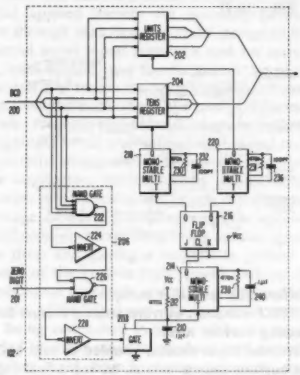
means coupled to said input means for detecting the presence of said digital signals;

delay means coupled to said detecting means for providing a control signal at a predetermined time interval after detection of the presence of said digital signals;

switching means coupled to said delay means and responsive to successive ones of said control signals for providing alternate first and second output signals; and

first and second register means, each having input terminals coupled to said input means and each having storage enabling terminals coupled to said switching means, said

first register being responsive to said first output signal and said second register being responsive to said second



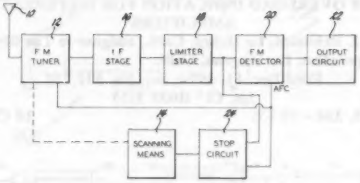
output signal for storing, respectively, first and second digit-representative signals supplied by said input means.

3,947,774

SIGNAL SEEKING STOPPING CIRCUIT RECEIVER

Timothy P. Glennon, and Douglas E. Martin, both of Kokomo, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 25, 1974, Ser. No. 526,637
Int. Cl.² H04B *1/32*
U.S. Cl. 325—470 **3 Claims**



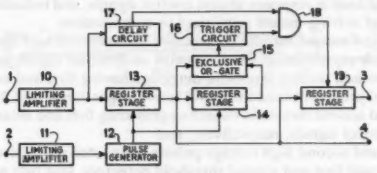
1. In a frequency modulated receiver including tuning means, IF amplifying means, and detector means for developing a DC voltage representing the frequency of the IF carrier signal for automatic frequency control, the combination of means for scanning the frequency band of said receiver said scanning means coupled to said tuning means, means for initiating a scanning of said frequency band, means responsive to the output of said IF amplifier means during said scanning for developing a first control signal when the amplitude of the output reaches a predetermined threshold, means responsive to said DC voltage for developing a second control signal when said DC voltage is within upper and lower voltage limits on either side respectively of a voltage corresponding to the center frequency of the band pass of said IF amplifying means, and means responsive to the coincidence of said first control signal and said second control signal for terminating the scanning of said frequency band.

3,947,775

PHASE AND FREQUENCY COMPARATOR

Jean-Jacques Thiebaut, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Apr. 30, 1974, Ser. No. 465,548
Claims priority, application France, May 16, 1973, 73.17735; May 14, 1973, 73.17364
Int. Cl.² H04B *1/02*
U.S. Cl. 328—133 **3 Claims**



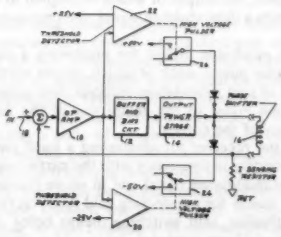
1. A phase and frequency comparator having first and second inputs for respectively receiving a reference signal of period T and a second signal, and comprising: a comparison circuit coupled to said first and second inputs, and comprising means for, each time said second signal has a predetermined phase ϕ_o for which the amplitude of said second signal is zero, determining the sign of the phase-shift, measured between $-\pi$ and $+\pi$, of said reference signal relatively to said second signal, and delivering to said output a phase-shift digital signal having one or the other of two values depending upon the sign of this phase-shift; and a second circuit coupled to said first input, and to said output of said comparison circuit, comprising comparison means and gating means for detecting those particular phase-shift digital signals which simultaneously fulfill the two following conditions (i) they differ in value from the preceding phase-shift digital signal and (ii) they occur while the phase of the reference signal is included in a limited phase interval comprising one and only one value for which the amplitude of the reference signal is zero, and delivering to said output of said second circuit a frequency difference signal, the value of which is equal to the value of the last detected one of said particular phase-shift signals.

3,947,776

INDUCTIVE LOAD DRIVER WITH FAST SWITCHING CAPABILITY

Daniel A. Stevens, Arnold; John Logis, Jr., Severna Park, and Ronald C. Scheerer, Baltimore, all of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 22, 1974, Ser. No. 516,936
Int. Cl.² H03K *5/20, 3/00*
U.S. Cl. 328—147 **5 Claims**



1. An inductive load driver apparatus with fast switching capability comprising in combination:

a feedback current amplifier having an input signal, said feedback current amplifier receiving a feedback signal from the load, said feedback signal being summed with said input signal to provide an output signal to said load, and,

means for driving an inductive load connected to said feedback current amplifier to sense said output signal, said inductive load driving means generating a control signal in response to said output signal, said inductive load driving means applying a high voltage output signal to said load in response to said control signals, said inductive load driving means comprises in combination:

first and second threshold detectors connected to said feedback current amplifier to receive said output signal, said first and second threshold detectors having first and second predetermined threshold levels respectively, said first and second threshold detectors providing first and second control signals, respectively, and

first and second high voltage pulsers connected respectively to said first and second threshold detectors, said first and second high voltage pulsers being activated by said first and second control signals respectively, said first high voltage pulser being responsive to said first control signals to provide a first high voltage to said load, said second high voltage pulser being responsive to said second control signal to provide a second high voltage to said load.

3,947,777
CIRCUIT ARRANGEMENT FOR THE DEMODULATION OF A PHASE-MODULATED SIGNAL

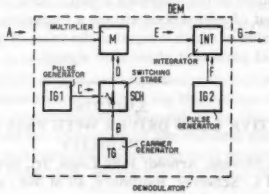
Erich Burger, Unterpfaffenhofen, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 19, 1974, Ser. No. 452,540

Claims priority, application Germany, Mar. 27, 1973, 2315206

Int. Cl.² H03D *3/06*

U.S. Cl. 329—122 **7 Claims**



1. In apparatus in a receiver for demodulating a phase modulated signal, which signal is constituted by at least one carrier and a consecutive series of modulation section, wherein the received modulated signal is coupled to an analogue multiplier, the output of which is coupled to an integrator which emits a demodulated signal, the improvement comprising:

first pulse generator means for producing a sequence of rectangular pulses, each of which occurs within a different one of said modulation sections, said pulses being of a duration equal to the reciprocal of the fundamental frequency of the carrier,

means in the receiver for generating a local carrier signal corresponding in frequency with the carrier signal of said received modulated signal and in phase therewith, and

switching means for connecting said local carrier signal to said multiplier, said switching means being operable to connect said local carrier signal to said multiplier responsive to the output of said pulse generator means,

said multiplier producing an output having a value which is the product of said received carrier signal and said switched local carrier signal.

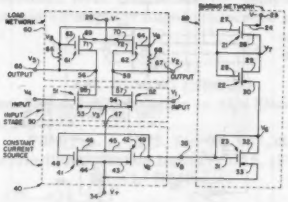
3,947,778
DIFFERENTIAL AMPLIFIER

Perng Hsiao, and Fuad H. Musa, both of Tempe, Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed Sept. 11, 1974, Ser. No. 505,101

Int. Cl.² H03F *3/68*

U.S. Cl. 330—30 D **17 Claims**



1. A differential amplifier comprising:

a. MOSFET constant current source means for setting an operating current level;

b. differential input means, coupled to said MOSFET constant current source means, having a first input terminal and a second input terminal for receiving two input signals to be compared, said differential input means comprising MOSFET devices of a first conductivity type;

c. load means comprising MOSFET active load devices of a second conductivity type opposite to said first conductivity type, coupled to said differential input means and coupled to one or more output terminals for producing an output signal responsive to said differential input means, said output terminal having a quiescient operating point determined by said operating current level;

d. load bias means coupled to said output terminals and said active loads for generating a compensating response to variations in said operating current level to maintain said quiescient operating point while also maintaining balanced operation of said output signal.

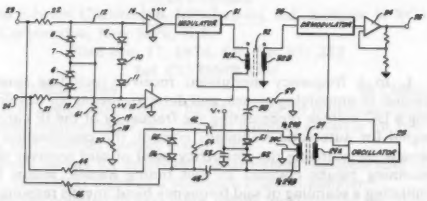
3,947,779
INPUT BIAS AND SIGNAL CONDITIONING CIRCUIT WITH OVERLOAD INDICATION FOR DIFFERENTIAL AMPLIFIERS

Clyde J. Reinhard, La Habra, Calif., assignor to The Birtcher Corporation, Los Angeles, Calif.

Filed Dec. 11, 1974, Ser. No. 531,731

Int. Cl.² H03F *3/38*

U.S. Cl. 330—10 **10 Claims**



1. An input bias circuit of interconnected unidirectional and bipolar conductive devices for biasing an amplifier of the type having a pair of differential input signal terminals and having a certain input signal voltage which drives the amplifier into lock-up, comprising:

first, second, third and fourth strings of series connected like poled unidirectional conductive devices, each string having at least one device therein, said first and fourth strings being connected in parallel and poled in opposite

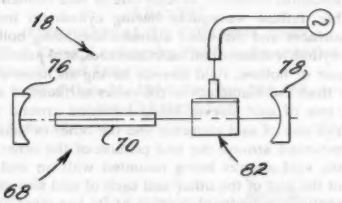
directions and said second and third strings being connected in parallel and poled in opposite directions, thereby forming two sets of parallel strings, said two sets being connected in series between the pair of differential input signal terminals of the amplifier, the junction between said two sets of parallel strings having a voltage potential applied thereto for normally providing bias current through said first and third strings to the pair of differential input signal terminals and for normally rendering said second and fourth strings non-conductive, said second and fourth strings alternately becoming conductive to clamp each one of the pair of differential input terminals, respectively, to said junction potential when the magnitude of an alternating input signal renders said first and third strings non-conductive, respectively; and a bipolar conductive device having a first voltage drop thereacross when conducting in one direction and a second voltage drop when conducting in the opposite direction, said second voltage drop being greater than said first voltage drop and having a magnitude greater than the amplitude of the certain input signal lock-up voltage at the input signal terminals to the amplifier and less than a magnitude which damages the amplifier, said bipolar device being connected in series with said fourth string and poled in a direction to produce said second voltage drop when said fourth string becomes conductive, thereby impressing said second voltage drop across the input terminals of the amplifier and driving the amplifier into lock-up as an indication of excessive voltage input into the amplifier.

3,947,780

ACOUSTOOPTIC MODE-LOCKER FREQUENCY DOUBLER

Robert R. Rice, and Gordon H. Burkhart, both of St. Louis County, Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Oct. 21, 1974, Ser. No. 516,409
Int. Cl.² H01S 3/10
U.S. Cl. 331—94.5 M **20 Claims**



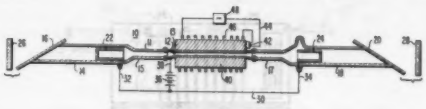
1. A laser construction including a laser cavity and means in the cavity which when stimulated produce a laser output, said laser cavity having an optical axis and a pair of spaced reflectors positioned thereon, the improvement comprising means positioned in the laser cavity in optical communication with the laser output to mode-lock and frequency double the laser output, said means including an acoustooptical crystal member having mutually perpendicular crystalline axes one of which is oriented at the Bragg angle with respect to the optical axis of the laser, transducer means attached to a side surface of the crystal member that is substantially parallel to the optical axis of the laser, means for exciting the transducer at a frequency equal to one-half of the axial mode spacing ($c/2l$) for the laser cavity to establish an acoustic standing wave in the crystal member which produces loss modulation at a frequency of ($c/2l$), said crystal being selected from crystal materials that have non-linear characteristics so that it is capable of converting the laser energy of one wavelength to laser energy at half the said one wavelength.

3,947,781

LASER DEVICE

Karl Gerhard Hernqvist, 667 Lake Drive, Princeton, N.J. 08540

Filed Feb. 27, 1975, Ser. No. 553,638
Int. Cl.² H01S 3/02
U.S. Cl. 331—94.5 D **17 Claims**



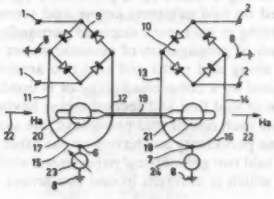
1. A laser device comprising a closed envelope, a gaseous filling within said envelope, an anode electrode and a cathode electrode having surface portions within said envelope exposed to said gaseous filling, said cathode surface portions being coated with a vaporizable metal, and means for retaining said coated cathode surface portions at a temperature within a small range of values including the vaporization temperature of said vaporizable metal.

3,947,782

DIODE RING MIXER

Klaus Lohn, Walhorn, Belgium, assignor to U. S. Philips Corporation, New York, N.Y.

Filed Oct. 17, 1974, Ser. No. 515,451
Claims priority, application Germany, Oct. 30, 1973, 2354262
Int. Cl.² H03D 7/02; H04B 1/26
U.S. Cl. 332—29 M **2 Claims**



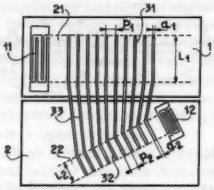
1. A diode ring mixer comprising four diodes which are series connected in a closed ring, a first pair of conductors connected to two non-adjacent junctions of the diodes to apply thereto an input signal, a first local oscillator, a second pair of conductors symmetrically connected between the other two junctions and said first oscillator, a ferromagnetic filter including a body of a high-frequency gyromagnetic material, said second pair of conductors being coupled to said body and symmetrically arranged in a first plane of symmetry of said body, said body being magnetically prepolarized parallel to a plane through the second pair of conductors and perpendicular to said first plane of symmetry, the intensity of prepolarization being such that magnetic resonance occurs in the material, and an output line including two output conductors forming a loop magnetically coupled to said body and symmetrically arranged in a second plane of symmetry of said body perpendicular to said first plane of symmetry.

3,947,783

ACOUSTIC SURFACE WAVE DEVICE COMPRISING ARRAYS OF PARALLEL METALLIC STRIPS

Charles Maerfeld, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Aug. 1, 1974, Ser. No. 493,976
Claims priority, application France, Aug. 7, 1973, 73.28793
Int. Cl.[2] H03H *9/26, 9/30, 9/32;* **H01L** *41/10*
U.S. Cl. 333—30 R **5 Claims**



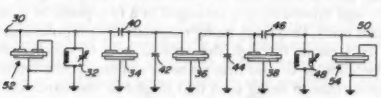
1. An acoustic surface wave device comprising:
a substrate made of a material able to propagate surface acoustic waves;
at least two paths at the surface of said substrate, for propagation of surface acoustic waves, the material assuming said propagation along each one of said two paths being the same for said two paths;
at least one input transducer disposed on said substrate for converting high frequency electrical waves applied thereto into acoustic waves propagating along a first one of said two paths;
at least one output transducer disposed on said substrate for converting surface acoustic waves propagating along the second one of said two paths into electrical waves;
and an acoustic surface wave coupler disposed on said substrate for providing a coupling between said first and second paths, said coupler comprising a first array of N parallel conductive strips having a width a_1, a periodicity p_1 and a length l_1, disposed on said substrate across said first path and a second array of N parallel conductive strips having a width a_2, a periodicity p_2, and length l_2 disposed on said substrate across said second path, said strips being in each path disposed perpendicularly to the direction of propagation of acoustic waves when propagating along said paths and said two arrays being interconnected by a connecting array of N conductive strips;
said strips of said first and second arrays having on the one hand for each one of said two arrays, the same width and the same periodicity and having on the other hand at least one of said two geometrical parameters: width, and periodicity, which is different in said two arrays.

3,947,784

DUAL-COUPLED MONOLITHIC CRYSTAL ELEMENT FOR MODIFYING RESPONSE OF FILTER

Aristotelis Arvanitis, Addison; Stanley Malinowski, Park Ridge, both of Ill.; Craig P. Smith, deceased, late of Addison, Ill., by Paul N. Page, administrator, Arlington Heights, Ill., assignors to Motorola, Inc., Chicago, Ill.

Filed Sept. 19, 1974, Ser. No. 507,317
Int. Cl.[2] H03H *9/04, 9/26, 9/32*
U.S. Cl. 333—72 **9 Claims**



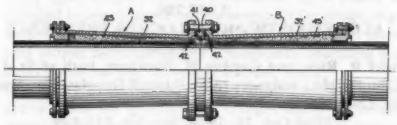
1. A shunt circuit for use with an electrical filter having an input signal conductor, an output signal conductor, a reference potential and which has a predetermined response characteristic, for bypassing signals of a predetermined frequency band which are applied between said signal conductor and said reference potential, including in combination,
a piezoelectric element including a body of material having piezoelectric characteristics with first and second coupled portions,
electrode means on said body forming first and second pairs of electrodes associated with said first and second portions, respectively, said electrodes of each of said pairs being positioned on opposite sides of said body,
first conductor means connecting said electrodes of said first pair between said input signal conductor and said reference potential, and
second conductor means connecting both of said electrodes of said second pair of electrodes to said reference potential.

3,947,785

METHOD AND APPARATUS FOR JOINING A FLEXIBLE WAVEGUIDE TO ANOTHER ELEMENT

Antonio Ferrentino, Monza, Italy, assignor to Industrie Pirelli Societa per Azioni, Milan, Italy

Division of Ser. No. 426,495, Dec. 20, 1973, Pat. No. 3,898,727. This application Jan. 30, 1975, Ser. No. 545,544
Claims priority, application Italy, Feb. 2, 1973, 19943/73
Int. Cl.[2] H01P *1/04, 11/00, 3/14*
U.S. Cl. 333—98 R **2 Claims**



1. A joint between the adjacent ends of a pair of waveguide communication elements, at least one of said elements being a flexible, hollow waveguide having cylindrical inner and outer surfaces and the other element also being hollow and having cylindrical inner and outer surfaces, said joint comprising a pair of hollow, rigid sleeves having an inner diameter greater than the diameters of the outer surfaces of said elements, one of said sleeves being mounted around the end portion of one of said elements and the other of said sleeves being mounted around the end portion of the other of said elements, said sleeves being mounted with an end of one adjacent the end of the other and each of said sleeves having a substantially cylindrical portion at its last-mentioned end and an outwardly extending flange spaced from its last-mentioned end, a centering ring intermediate the flange of one sleeve and the flange of the other sleeve and closely fitting around the cylindrical portions of both sleeves, means securing the flange of one sleeve to the flange of the other sleeve, and a solid resin material filling the spaces between the interior surface of each sleeve and the exterior surface of each element.

3,947,786

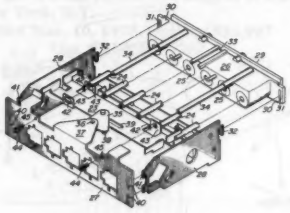
SUPPORT STRUCTURE FOR PUSHBUTTON RADIO TUNER ASSEMBLY

Frank John Gordon, Chicago, Ill., assignor to Motorola, Inc., Chicago, Ill.

Filed May 2, 1975, Ser. No. 574,190
Int. Cl.[2] H03J *5/32;* **F16H** *35/18*
U.S. Cl. 334—7 **5 Claims**

1. In the tuner for a radio receiver, a tuning assembly comprising:
a plurality of coils for tuning the receiver;

carriage means adapted for reciprocating movement;
drive means for moving the carriage means;
manual control means for controlling the drive means to select a desired frequency;
pushbutton control means for predetermining certain desired frequencies and for selecting one of the predetermined frequencies;
a plurality of tuning coil cores mounted on the carriage means for movement therewith, the movement of the cores being within and coaxial with the coils;



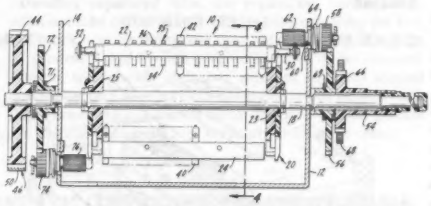
a support structure having a front portion and rear portion, the latter portion including as one portion thereof a one-piece molded housing for receiving all of the tuning coils;
first guide means integral with the housing for guiding the movement of the core carriage;
screw means for fastening the first guide means to the front portion of the support structure, the front portion having apertures for allowing passage of the screw means;
threaded means integral with the first guide means for receiving the screw means, whereby the front-to-back dimension of the support structure remains substantially constant.

3,947,787

MECHANICAL TV CONTROL UNIT

Patrick R. J. Court, Los Angeles, Calif., assignor to Oak Industries Inc., Crystal Lake

Filed Dec. 26, 1974, Ser. No. 536,350
Int. Cl.² H03J 5/30
U.S. Cl. 334—51 **22 Claims**



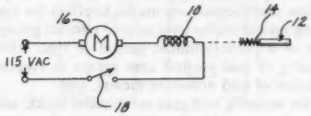
1. A means for providing TV tuning signals including a housing, a turret rotatable in said housing, a plurality of coil forms mounted on said turret for rotation therewith, a pair of tuning coils on each coil form, independent adjustable tuning means at each end of each coil form,
a rotatable shaft extending outwardly from said housing for use in rotating said turret, cooperating detent means on said shaft and housing,
and means operable from one end of said housing for effecting individual independent rotation of said adjustable tuning means.

3,947,788

SOLENOID

William R. Berry, Menomonee Falls, Wis., assignor to Spencer C. Schantz, New Berlin, Wis.

Filed Sept. 3, 1974, Ser. No. 502,579
Int. Cl.² H01H 9/00
U.S. Cl. 335—68 **9 Claims**



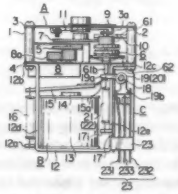
1. In an electric circuit having an electric motor and having a starting switch for said motor, a solenoid having a coil and having a plunger mounted for movement in one direction as a result of magnetic attraction when the coil is energized, and there being spring means associated with the plunger to normally urge the latter in a return direction, the improvement comprising having the solenoid coil in series in the electric circuit with said motor and starting switch, and having said spring means of less strength than the strength of the magnetic attraction between the coil and plunger when motor-starting inrush current is flowing through said coil but being of greater strength than the strength of said magnetic attraction when motor-running current is flowing through the coil to automatically cause quick return movement of the plunger while the coil is still energized, whereby quick movement of the plunger in both directions is initiated whenever the motor is started.

3,947,789

MOTOR TIMER

Teizo Fujita; Tosiro Ohashi, and Toyohiko Chiba, all of Osaka, Japan, assignors to Izumi Denki Company Limited, Osaka, Japan

Filed Nov. 11, 1974, Ser. No. 522,833
Claims priority, application Japan, Nov. 14, 1973, 48-128083; Nov. 14, 1973, 48-128084; Nov. 14, 1973, 48-128085
Int. Cl.² H01H 43/02
U.S. Cl. 335—74 **15 Claims**



1. A motor timer comprising:
a prefabricated timing gear mechanism block including a drive motor, reduction gear means coupled with said drive motor, a timing gear for performing a timing operation, and clutch means for selectively connecting and disconnecting said reduction gear means to and from said timing gear;
a prefabricated electromagnetic means block disposed on the underside of said gear mechanism block and including a substantially channel-shaped yoke, electromagnetic coil means mounted in said yoke, and armature means adapted to be actuated in response to the energization of said electomagnetic coil means;
a prefabricated contact mechanism block including a spring contact assembly having first and second contact groups, first cam means releasably engaged with said armature means and adapted to effect the opening and closing

operation for said first contact group as soon as said first cam means has been released from said engagement with said armature means in response to the actuation of said armature means, means for actuating said clutch means in response to the actuation of said first cam means, second cam means releasably engaged with said armature means for effecting the opening and closing operation for said second contact group, and means for operatively connecting said timing gear with said second cam means to allow said second cam means to effect the opening and closing operation for said second contact group after the lapse of a predetermined period of time following the releasing of said second cam means in response to the actuation of said armature means; and

means for securing said gear mechanism block, said electromagnetic means block and said contact means block to one another.

3,947,790

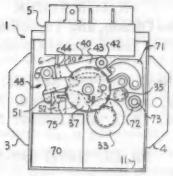
AUTOMATIC RESET TIMER

John L. Harris, Clearwater, Fla., assignor to Deltrol Corporation, Bellwood, Ill.

Filed Sept. 13, 1974, Ser. No. 505,547

Int. Cl.² H01H *43/00*

U.S. Cl. 335—75 **19 Claims**



1. In an automatic reset timer having a timer motor and mechanism components including a spring return timing element and drive means including a clutch whereby the timing element is driven in one direction when the clutch is engaged and returns to a starting point when the clutch is disengaged, a clutch operating lever for controlling the clutch, said clutch lever having a pivot, a first operating surface on one side of the pivot and a second operating surface on the other side of the pivot, an electromagnet, an operator actuated by the electromagnet and adjacent to the clutch operating lever, means including an enclosure plate for at least partially enclosing the mechanism components, the clutch lever and the operator, said operator being mounted near said plate on one side thereof, and first and second abutment means bodily carried by the operator and arranged to cooperate with the first and second operating surfaces respectively of the clutch lever to cause movement thereof in response to movement of the electromagnet, each abutment means being adjustable on the operator between an active position where it is operable to cause movement of the clutch lever and an inactive position where it has no effect on the clutch lever, and means accessible from the other side of the plate for adjusting the positions of said abutment means.

3,947,791

LOCKING DEVICE HAVING LOW CONTROL POWER FOR AN ELECTRICAL DEVICE

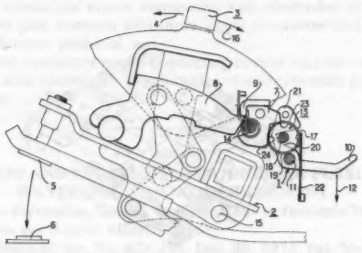
Jean Hennemann, Homblieres, France, assignor to UNELEC, Cedex, France

Filed Jan. 13, 1975, Ser. No. 540,463

Claims priority, application France, Jan. 22, 1974, 74.02091

Int. Cl.² H01H *73/02*

U.S. Cl. 335—167 **8 Claims**



1. Locking device having a low control power for locking an electrical device including a lockable part, said control device comprising: a locking control element, a locking assembly operatively positioned between said lockable part and said locking control element and responsive to movement of the locking control element to release said lockable part; the improvement wherein: a bolt is operatively positioned between said locking assembly and said lockable part for selectively locking and unlocking said lockable part and in turn being selectively locked by said assembly, and wherein said assembly comprises a rotating bearing and at least one coaxial disk, said bearing and said disk respectively being in rolling contact at their periphery with said bolt and with a fixed bearing surface and wherein said bearing assembly is floatingly mounted on said control element.

3,947,792

ELECTROMAGNETIC RELAY

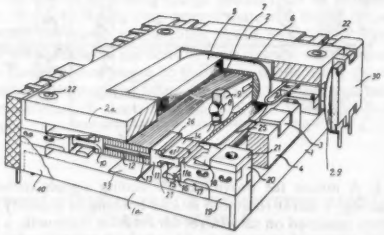
Hans-Werner Reuting, Peine, Germany, assignor to Elmeg Elektro-Mechanik GmbH, Peine, Germany

Filed Sept. 3, 1974, Ser. No. 502,802

Claims priority, application Germany, Sept. 3, 1973, 2344365

Int. Cl.² H01H *9/30*

U.S. Cl. 335—201 **12 Claims**



1. In an electromagnetic relay having at least one movable contact on an armature and cooperating with at least one stationary contact, the improvement comprising at least one of the contacts constructed and contoured to have curved cylindrical surface contour, so that the contacts make contact

along a line of contact closing only, extending transversely to the direction of movement of the movable contact, when the relay is actuated; and means for generating a magnetic flux extending transversely to the said direction of movement of the contacts as well as transversely to said line and parallel to and in the vicinity of the contact surfaces, so that any arc is forced along said line following opening of the contacts and for at least a period during which the movable contacts are being moved.

3,947,793

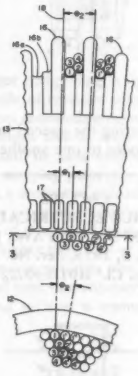
MULTI-LAYER TOROIDAL DEFLECTION YOKE

Ira Foy Thompson, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 10, 1975, Ser. No. 556,997

Int. Cl.² H01F 7/00

U.S. Cl. 335—210 **7 Claims**



1. A multi-layer toroidal deflection yoke comprising:

a hollow flared ferrite core;

first and second conductor turn retaining ring members respectively disposed at the small diameter rear portion and the large diameter front portion of said core for fixedly retaining a plurality of conductor turns toroidally wound around said core for forming a deflection winding;

said second ring member including a plurality of radially extending separated tabs, the separation between two adjacent tabs defining a conductor turn receiving pocket, said pocket width being less than the combined diameters of generally side-by-side conductor turns to be received therein, said pocket including adjacent first and second conductor turn seat portions having different heights such that successive conductor turns disposed in said pocket are disposed laterally and vertically from each other.

3,947,794

MAGNETIC CORE ASSEMBLIES WITH ADJUSTABLE RELUCTANCE AS A FUNCTION OF TEMPERATURE

Clive Victor Newcomb, Salford, England, assignor to U.S. Philips Corporation, New York, N.Y.

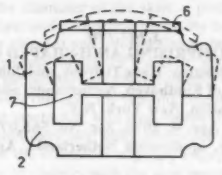
Continuation of Ser. No. 417,548, Nov. 20, 1973. This application Feb. 10, 1975, Ser. No. 548,437.

Claims priority, application United Kingdom, Dec. 11, 1972, 57060/72

Int. Cl.² H01F 1/00

U.S. Cl. 335—217 **10 Claims**

1. A core body for a coil means, comprising a core including two core members composed of ferromagnetic material which are fixed together so that an air gap is defined between two surfaces of the core members, a non-magnetic member comprising a thin metal plate having a temperature coefficient of expansion which differs from that of the ferromagnetic core material, said non-magnetic member being held in intimate



contact with a surface of the core and located outside of the main flux path of the core body and arranged such that the resulting different coefficients of expansion cause a variation of the length of said air gap with temperature to thereby adjust the reluctance of the core as a function of the temperature.

3,947,795

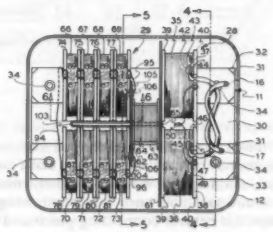
TRANSFORMER WINDING MEANS AND METHODS

Donald E. Donnelly, Edwardsville, Ill.; Jerry W. McElroy, St. Louis, and Arlie H. Ehlmann, Barnhart, both of Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Aug. 12, 1974, Ser. No. 496,388

Int. Cl.² H01F 27/30

U.S. Cl. 336—184 **6 Claims**



1. In a transformer, a primary winding, a secondary winding, an iron core having spaced parallel portions, both said windings being mounted in inductive relationship with said iron core, said secondary winding being wound on a plurality of insulative bobbins apertured for receiving therein said core, each of said bobbins being formed with flanges at opposite ends to define a winding space for a portion of said secondary winding, each of said winding portions having a start end and a finish end, a first anchoring tab extending radially from the peripheral edge of one of said flanges of each of said bobbins and around which said start end of each of said winding portions is wrapped, a second anchoring tab extending radially from the peripheral edge of the other of said flanges of each of said bobbins and around which said finish end of each of said winding portions is wrapped, said bobbins and winding portions being mounted end to end in a pair of banks on said parallel iron core portions with said radial tabs in alignment, a first means for electrically connecting said finish ends and start ends on said adjacent second and first tabs so that said adjacent winding portions in each of said banks are connected in series, a second means for electrically connecting said finish end on said second tab of a last bobbin in one of said banks to said start end on said first tab of a first bobbin in the other of said banks so that said banks are connected in series, and a third means for electrically connecting said start end on said first tab of a first bobbin in said one of said banks to a secon-

dary winding lead and for electrically connecting said finish end on said second tab of a last bobbin in said other of said banks to another secondary winding lead so that said banks are connected in series between said secondary leads.

3,947,796

COIL SHAPE COMPRISING AN H-SHAPED COIL CORE

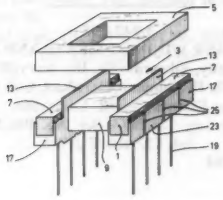
Willem Johannes Postma; Hans Tielrooy, and Johannes Hubertus Tobben, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 4, 1975, Ser. No. 565,070

Claims priority, application Netherlands, Apr. 24, 1974, 7405491

Int. Cl.² H01F *27/30*

U.S. Cl. 336—192 **9 Claims**



1. A coil frame comprising an H-shaped ferromagnetic coil core having a central connecting piece on both sides of which a leg is formed, a coil former made of synthetic material which is moulded about said coil core and comprising a coil can which envelops the central connecting piece and a U-shaped trough formed on both sides of the coil can, each leg of the coil core being located within a trough so that each trough encloses a respective leg of the coil core on three sides whereby an uninterrupted side of each leg of the coil core is maintained free from synthetic material, the ends of the legs being maintained free from synthetic material, the coil can including at least one groove recessed therein and extending over the entire length of the coil can, and at least two grooves recessed in each trough of synthetic material on the outside with the grooves extending transverse to the longitudinal direction of the legs of the H-shaped coil core.

3,947,797

CIRCUIT INTERRUPTING MEANS

Jacob A. Randmer, Wilton, Conn., assignor to The Machlett Laboratories, Inc., Stamford, Conn.

Filed June 7, 1974, Ser. No. 477,393

Int. Cl.² H01H *39/00*

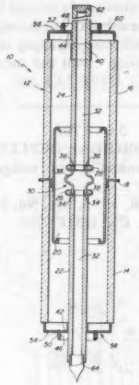
U.S. Cl. 337—31 **8 Claims**

1. A circuit interrupting device comprising:

an evacuated envelope;

tubular conductive means including a pair of tubular electrodes having spaced inner end portions open to one another within the envelope and sealable outer end portions external of the envelope for providing a passageway through the envelope; and

conductive fusible means disposed within the envelope for



electrically connecting the spaced inner end portions of the tubular electrodes to one another.

3,947,798

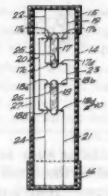
RE-USABLE ELECTRICAL FUSE

Robert H. Zankl, 10735 SW. 58th Ave., Miami, Fla. 33173

Filed Mar. 5, 1975, Ser. No. 555,563

Int. Cl.² H01H *85/22*

U.S. Cl. 337—228 **8 Claims**

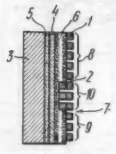


1. A re-usable electrical fuse comprising, in combination, an elongated, non-electrically conductive, normally vertically-extending, transparent hollow capsule of high temperature resistant glass, a first pair of electrical switch contacts extending inwardly of said capsule at one end thereof, a second pair of electrical switch contacts extending inwardly of said capsule at the other end thereof, a charge of fusable metal within said capsule and normally disposed within the upper end portion thereof and in close-circuiting relation with respect to said first pair of electrical switch contacts, a first fuse circuit connector means in series with said first pair of electrical switch contacts, and a second fuse circuit connector means in series with said second pair of electrical switch contacts, whereby, upon a current overload occurring in an electrical load circuit connected in series with said first fuse circuit connector means, said charge of fusable metal will be brought to molten temperature to fall by gravity into the lower end portion of said capsule to solidify in close-circuiting relation with respect to said second pair of electrical switch contacts while at the same time open-circuiting said first pair of electrical switch contacts, as will be readily observable upon visual inspection of said capsule, whereupon said re-usable electrical fuse can be re-used simply by rotating it through **180** degrees end-for-end in a second normal position and connecting the electrical load circuit in series with said second pair of electrical switch contacts.

3,947,799
PRINTED RESISTOR

Valentina Evgenievna Epaneshnikova, ulitsa Grazhdanskaya, 3, kv. 8; Evgenia Alexandrovna Kondratskaya, ulitsa Novo-Kuznechnaya, 10, kv. 10; Grigory Karpovich Primak, Rostovskoe shosse, 6, kv. 75; Viktor Sergeevich Umantsev, ulitsa Zipovskaya, 1, kv. 6, and Svetlana Alexandrovna Okun, ulitsa Mekhanicheskaya, 5, kv. 4, all of Krasnodar, U.S.S.R.

Filed Jan. 15, 1975, Ser. No. 541,144
Int. Cl.² H01C 7/06
U.S. Cl. 338—9 1 Claim

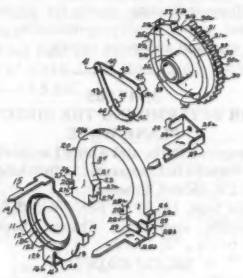


1. A printed resistor comprising: a rigid substrate, a current-carrying pattern made of resistive alloy foil and fixed to said substrate, two current terminals electrically connected to said current-carrying pattern and at least one potential terminal electrically connected to said current-carrying pattern, in which said current-carrying pattern is made as a network of series-parallel arms, a section of at least one of siad series-parallel arms serving as a temperature-compensating element of the resistor is made of a material whose temperature coefficient of resistance is higher than that of the material of the rest of said current-carrying pattern, one side of said section is connected to one of said current-carrying terminals and the opposite side of said section is connected to said potential terminal.

3,947,800
VARIABLE RESISTANCE CONTROL

John D. Van Benthuysen, Elkhart, Ind., and Thomas W. Flanders, Edwardsburg, Mich., assignors to CTS Corporation, Elkhart, Ind.

Filed Feb. 4, 1974, Ser. No. 439,034
Int. Cl.² H01L 10/34
U.S. Cl. 338—163 2 Claims

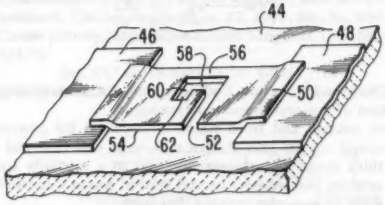


1. A variable resistance control comprising an electrically conductive supporting plate, a U-shaped resistance element mounted on the supporting plate, the element comprising an electrically nonconductive base having an arcuate portion and a pair of spaced legs and an arcuate resistance path on one side of the base, the other side of the base engaging the supporting plate, a collector integral with the supporting plate, a driver rotatably secured to the supporting plate, a contactor wipably engaging the resistance element and the collector and constrained to rotate with the driver, the resistance element being sandwiched between the driver and the supporting plate, an annular skirt depending from the driver and defining a cavity, the skirt engaging the resistance element, the contactor being disposed within the cavity defined by the skirt, a knob integral with the skirt, the diameter of the knob being larger than the diameter of the skirt, a post integral with the supporting plate and projecting upwardly between the legs of the resistance element and intersecting a plane of the base, the post being disposed outside of the skirt, and stop means integral with and projecting radially outwardly from the driver and engageable with the post for limiting angular rotation of the driver and the contactor, said stop means providing a portion of the skirt enclosure and lying above the plane of the base, the portion of the contactor wipingly engaging the resistance element being in registry with the stop means visually indicating the angular position of the contactor.

3,947,801
LASER-TRIMMED RESISTOR

Kenneth Roger Bube, Skillman, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 23, 1975, Ser. No. 543,622
Int. Cl.² H01C 1/012
U.S. Cl. 338—308 6 Claims

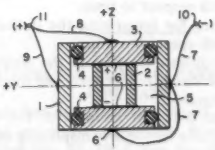


1. A film resistor comprising a resistive material disposed between conductive means, said resistive material containing one or more kerfs defining the path for an electrical current in said resistive material, said kerf having one end at an edge of the resistive material and a second end terminating in an area outside and away from said electrical current path.

3,947,802
OMNIDIRECTIONAL LOW NOISE PIEZOELECTRIC TRANSDUCER

Allan C. Tims, and Theodore A. Henriquez, both of Orlando, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 12, 1972, Ser. No. 261,861
Int. Cl.² H04B 13/00
U.S. Cl. 340—10 2 Claims



1. An electroacoustic transducer which comprises,
a circumferentially polarized piezoelectric cylinder,
a longitudinally polarized piezoelectric cylinder sealingly capped by two concentric imperforate diaphragms,

and isolation means sealingly mounting said longitudinally polarized cylinder and diaphragms concentrically within said circumferentially polarized cylinder,

said isolation means cooperating only radially between said diaphragms and the inner ends of said circumferentially polarized cylinder.

3,947,803

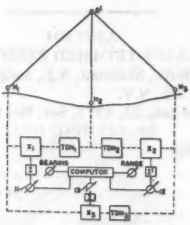
DIRECTION FINDING SYSTEM

Charles B. Brown, Kensington, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation of Ser. No. 459,561, Sept. 30, 1954, abandoned. This application May 12, 1971, Ser. No. 142,780

Int. Cl.[2] G01S *3/80*

U.S. Cl. 340—6 R **1 Claim**



1. A sound direction finding system for determining the location of a sound source comprising:

first, second and third sound transducers for converting sound signals into electrical signals, said first and said third sound transducers disposed in a mutually spaced relation with respect to said second sound transducer to form an isosceles triangle therewith:

a first variable time delay network for introducing a first predetermined variable time delay into the electrical output signal from said second sound transducer;

a second variable time delay network for introducing a second predetermined variable time delay into the electrical output signal from said second sound transducer;

a third variable time delay network for introducing a third predetermined variable time delay into the electrical output signal from said third sound transducer;

a first multiplier for multiplying the electrical output signal from said first sound transducer and the output signal from said first variable time delay network;

a second multiplier for multiplying the electrical output signal from said third sound transducer and the output signal from said second variable time delay network;

a third multiplier for multiplying the electrical output signal from said first sound transducer and the output signal from said third variable time delay network;

a first integrator for integrating the output of said first multiplier with respect to time;

a second integrator for integrating the output of said second multiplier with respect to time;

a third integrator for integrating the output of said third multiplier with respect to time;

a first visual indicator coupled to the output of said first integrator for visually displaying the output signal from said first integrator;

a second visual indicator coupled to the output of said second integrator for visually displaying the output signal from said second integrator;

a third visual indicator coupled to the output of said third integrator for visually displaying the output signal from said third integrator; and

a trigonometric computer coupled to said first, said second, and said third visual indicators for computing the range and bearing of said sound source.

3,947,804

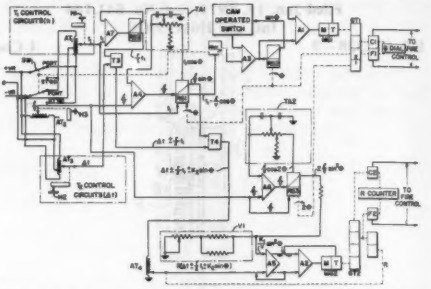
RANGE-BEARING COMPUTER

Charles W. Olson, Huntington Station, N.Y., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 11, 1963, Ser. No. 272,495

Int. Cl.[2] G01S *3/80*

U.S. Cl. 340—6 R **7 Claims**



1. In an electro-mechanical bearing computer in which the bearing angle of a target relative to a predetermined line is computed from the time interval between the arrivals of a wave front at two spaced locations and a constant voltage proportional to the distance of separation of the spaced locations, the velocity of propagation of the wave front, and the angle of inclination formed by the intersection of a line drawn through the spaced locations and a horizontal plane through one of the spaced locations,

a. means for generating a first signal proportional to said time interval,

b. means for generating a second signal proportional to said constant voltage,

c. first resolving means connected to said first and second signal generating means for providing an unmodified third signal equal to the difference between said first and second signals,

d. third signal detecting means connected to said resolving means for providing an error signal when said third signal is not a predetermined value and for providing a null signal when said third signal is said predetermined value,

e. means connected to said resolving means for modifying said third signal and providing an indication of the bearing angle relative to said target and a predetermined line,

f. means connected to said third signal detecting means and said modifying-indicating means for mechanically controlling said signal modifying-indicating means in response to said null and error signals.

3,947,805

DEVICE FOR DETERMINING THE DIRECTION OF A PLANE WAVE

Anne Marie Faugeras, Paris, and Andre Lambert, Sceaux, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, France

Filed Sept. 11, 1974, Ser. No. 505,009

Claims priority, application France, Sept. 11, 1973, 73.32606

Int. Cl.[2] G01S *3/80*

U.S. Cl. 340—6 R **5 Claims**

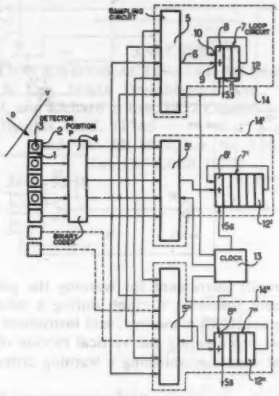
1. Device for determining the direction of propagation of a plane wave comprising:

a rectilinear base, comprising P places numbered from 1 to P regularly spaced on that base, P being a prime number, N of which each comprise a detector ($N \leq P$) the $P - N$ others being without a detector;

a clock sending out a sequence of pulses having a frequency of $1/\tau$;

several channels, each corresponding to a predetermined direction, each of the channels comprising a sampling

device to which are applied the signals obtained from the places P, the output of the sampling device being connected to the input of a loop, the said loop comprising an adder having two inputs, the first of whose inputs is connected to the output of the sampling device and a delay line constituted by $m - 1$ cells connected together in series, m being a positive whole number which is different for each channel, the input of the first cell being connected to the output of the adder and the output of the last cell being connected to the second input of the adder;



binary coding means arranged between the outputs of the places and the inputs of the loops;

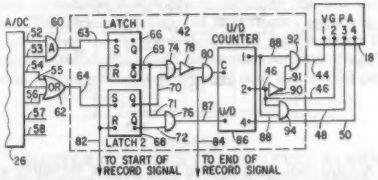
the pulses whose frequency is $1/\tau$ coming from the clock used for controlling the sampling devices as well as the progression of the digital signals obtained at the output of the adder of each channel along the loop thereof; and

the signals depending on the comparison between the direction of the plane wave and the predetermined direction corresponding to m being obtained at the output of one of the elements of the loop of the channel m.

3,947,806
AUTOMATIC GAIN CONTROL FOR SEISMOMETER RECORDERS

David P. Corkhill, Hertfordshire, England, and Francis R. Freeman, Tulsa, Okla., assignors to Standard Oil Company, Chicago, Ill.

Filed Feb. 10, 1975, Ser. No. 548,722
Int. Cl.² G01V *1/16*; H03F *3/68*; H03G *11/04*
U.S. Cl. 340—15.5 GC **10 Claims**



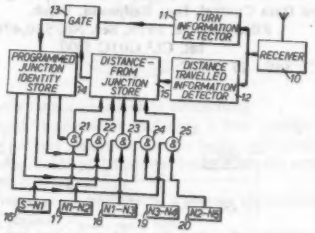
1. In a digital seismic recording system having at least one recording channel responsive to a first geophone group and including therein a preamplifier, a gain-ranging amplifier, and an analog-to-digital converter, all connected in series, said preamplifier including switching means to vary the gain of said preamplifier in a plurality of steps, said gain-ranging amplifier including means to vary the gain in steps at a relatively high rate, over a selected plurality of steps, said analog-to-digital converter adapted to produce a digital word representing the instantaneous amplitude of the signal output of said gain-ranging amplifier at each digitizing interval, said digital word comprising at least

1. a most significant bit,
2. a second most significant bit, and
3. an intermediately significant bit, the improvement comprising:
   a. a first latch and means responsive to said digital word output of said analog-to-digital converter to set said first latch when said most significant bit is a logical 1 at any time during the time of recording of a complete record;
   b. a second latch and means responsive to said digital word output of said analog-to-digital converter to set said second latch when at least one intermediately significant bit is a logical 1 at any time during the time of recording of a complete record; and
   c. means responsive respectively to said first and to said second latches to modify the gain of said preamplifier.

3,947,807
VEHICLE LOCATION SYSTEMS

Ronald Arthur Tyler, and Luigi de Tullio, both of Chelmsford, England, assignors to The Marconi Company Limited, Chelmsford, England

Continuation-in-part of Ser. No. 410,267, Oct. 26, 1973, abandoned. This application Aug. 22, 1975, Ser. No. 606,955
Claims priority, application United Kingdom, Oct. 28, 1972, 49831/72
Int. Cl.² G01S *9/02*, *9/56*; G08G *1/12*
U.S. Cl. 340—23 **10 Claims**



10. A vehicle location system for locating a vehicle travelling over a predetermined network of routes comprising vehicle borne means for deriving first information signals relating to the distance travelled by the vehicle, vehicle borne means for deriving second information signals relating to changes in the direction of travel of said vehicle, means for storing first data relating to the turn characteristics of junctions in said network, means for storing second data relating to the distance between junctions and means for computing, from said first and second information signals and said first and second data, a result concerning the location of said vehicle on said network.

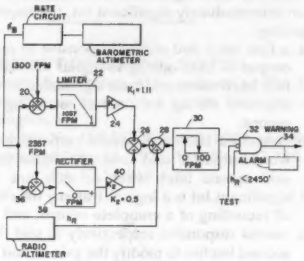
3,947,808
EXCESSIVE DESCENT RATE WARNING SYSTEM FOR AIRCRAFT

Charles Donald Bateman, Bellevue, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Jan. 22, 1975, Ser. No. 540,475
Int. Cl.² G01C *5/00*
U.S. Cl. 340—27 AT **22 Claims**

1. In a system for warning of an excessive rate of aircraft descent, having means for generating a signal representing the rate of descent of the aircraft, means for generating a signal representing altitude of the aircraft above ground, means for

combining the descent rate signal with the altitude signal and means for detecting a predetermined combination of said signals to initiate a warning, the improvement, comprising:



means for scaling one of said descent rate and altitude above ground signals so that the combination of descent rate and altitude for which said detector means initiates a warning establish a warning condition boundary representing at least in part a constant time to ground impact if the descent rate is unchanged.

3,947,809

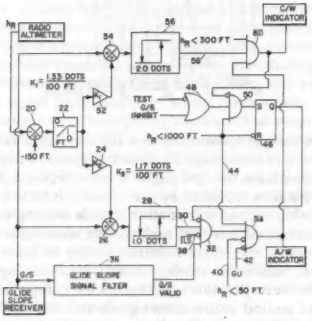
BELOW GLIDE SLOPE ADVISORY WARNING SYSTEM FOR AIRCRAFT

Charles Donald Bateman, Bellevue, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Jan. 22, 1975, Ser. No. 540,476

Int. Cl.² G01C *5/00*

U.S. Cl. 340—27 AT **26 Claims**



1. In a glide slope warning system for use by aircraft at airports having a glide slope radio beam, having means for generating a signal representing the deviation of the aircraft from the glide slope, and means for generating a signal representing the altitude of the aircraft above ground, improved means for generating a warning signal when the glide slope deviation exceeds predetermined limits, said improved warning signal generating means comprising:

means for generating a first warning signal, in response to the deviation signal; and

means for generating a second warning signal, in response to the deviation signal, when the aircraft is below at least one predefined altitude.

3,947,810

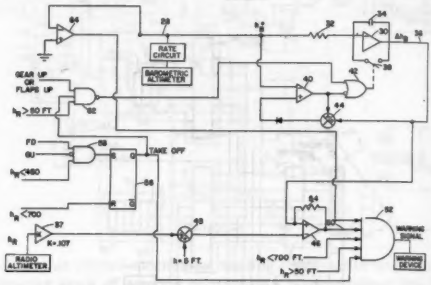
NEGATIVE CLIMB RATE AFTER TAKE-OFF WARNING SYSTEM WITH PREDETERMINED LOSS OF ALTITUDE INHIBIT

Charles Donald Bateman, Bellevue, and Hans Rudolf Muller, Kirkland, both of Wash., assignors to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Jan. 22, 1975, Ser. No. 540,477

Int. Cl.² G01C *5/00*

U.S. Cl. 340—27 AT **27 Claims**



1. In an aircraft instrument for warning the pilot of an excessive descent following a climb during a takeoff or a missed landing approach maneuver, said instrument having a source of signal representing the vertical motion of the aircraft, improved means establishing a warning criteria, comprising:

means responsive to said vertical motion signal for establishing a signal representing the net altitude loss of the aircraft from the high point of the flight path;

means for establishing an excessive altitude loss signal;

means for comparing said net altitude loss signal with said excessive altitude loss signal, the comparing means output indicating whether the net altitude loss which has occurred is excessive; and

means responsive to an output of the comparing means indicating an excessive net altitude loss for initiating a pilot warning.

3,947,811

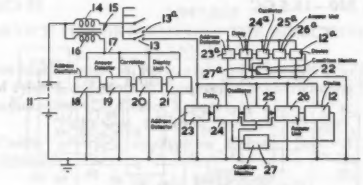
FAULT INDICATING SYSTEMS IN VEHICLES

Duncan Barry Hodgson, Whitnash near Leomington Spa, England, assignor to The Lucas Electrical Company Limited, Birmingham, England

Filed Sept. 26, 1974, Ser. No. 509,552

Int. Cl.² G08B *19/00*

U.S. Cl. 340—52 F **2 Claims**



1. A fault indicating system in a vehicle including a d.c. source, a plurality of electrically operated devices operated by said d.c. source, a plurality of fault indicating units, one for each device, each fault indicating unit being operable by a predetermined address signal and, on being operated, producing after a delay an output representative of the operational condition of its associated device, each fault indicating unit having a different delay, a current transformer having its primary winding connected to said devices and said fault indicating units, a monitoring unit for producing said address

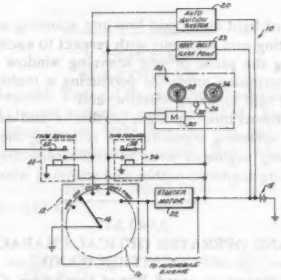
signal and receiving said output signal, said monitoring unit operating in cycles, in each of which it has a transmission period in which it feeds the address signal to all the fault indicating units by way of the supply leads from the d.c. source to said devices, and a plurality of receiving periods during which it receives the output signals from said fault indicating units in turn by way of said supply leads, and warning means operable by the monitoring unit to indicate a fault in any of said devices, said warning means and said monitoring unit being connected to the secondary winding of said current transformer.

3,947,812

IGNITION SWITCH-ACTIVATED MESSAGE SYSTEM

Joseph K Lee, 10616 Bramblebush Ave., Whittier, Calif. 90604, and Richard J. Lee, 1432 Countrywood Road, Hacienda Heights, Calif. 91745

Filed Nov. 20, 1974, Ser. No. 525,382
Int. Cl.² G08B *19/00*
U.S. Cl. 340—52 D **12 Claims**



1. A system for providing a message to the operator of an automobile, the system comprising a keyoperated ignition switch connected to the automobile ignition system, the ignition switch including a key barrel movable between a first position and a second position, means for activating the automobile ignition system when the key barrel is in either the first or second position, so the automobile engine will be operative in either the first or second position of the key barrel, a message device in the interior of the automobile, the message device comprising a tape player including forward tape drive means and tape rewind means, and further including means for activating the forward tape drive means when the key barrel is in the first position, and means for activating the tape rewind means when the key barrel is in the second position.

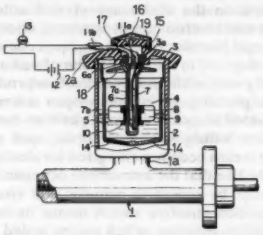
3,947,813

MASTER CYLINDER LIQUID LEVEL ALARM

Hiroshi Uemura, and Kaoru Tsubouchi, both of Toyota, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed June 27, 1974, Ser. No. 483,775
Claims priority, application Japan, July 3, 1973, 48-79601
Int. Cl.² G08B *21/00*
U.S. Cl. 340—59 **5 Claims**

1. A liquid level reduction alarm device for a braking liquid reservoir vessel kept in liquid communication with a brake master cylinder, said reservoir vessel being closed at its upper open end by an elastic cap member from which a case member is suspended to extend into the interior of the reservoir, said case member receiving a magnetically operated reed switch



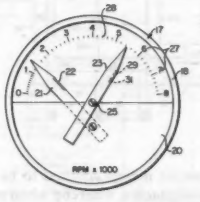
electrically connected through said cap member to an alarm circuit.

3,947,814

AUDIO TACHOMETER SYSTEM

James W. Allen, 3654 Lilac Ave. NW., Roanoke, Va. 24017

Filed Sept. 20, 1974, Ser. No. 507,704
Int. Cl.² B60Q *5/00*
U.S. Cl. 340—62 **11 Claims**



1. An audio tachometer system comprising:
an electronic tachometer including a first pointer and a second pointer, said first pointer being indicative of engine speed, said second pointer being manually settable to a desired engine speed;
an audio tone generator having a voltage input terminal;
a voltage source;
a pair of electrical contacts, each being electrically isolated form the other and rigidly mounted upon said second pointer, one of said contacts being interwired to said voltage source, the other of said contacts being interwired to said voltage input terminal of said audio tone generator; and
electrically conductive means upon said first pointer for bridgeably interconnecting said pair of contacts whenever said first pointer is positioned at the engine speed indicated by the second pointer, thereby interconnecting said voltage source to said voltage input terminal of said audio tone generator to energize said tone generator.

3,947,815

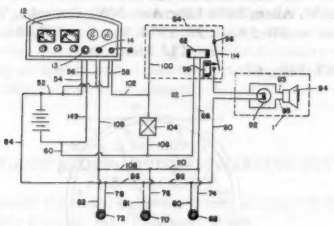
AUTOMOBILE EMERGENCY-ALERTING SYSTEM

Hrand M. Muncheryan, 1735 Morningside St., Orange, Calif. 92667

Filed May 9, 1975, Ser. No. 575,948
Int. Cl.² B60Q *1/00*; G08B *21/00*
U.S. Cl. 340—88 **20 Claims**

1. An automobile emergency-alerting system, comprising: an acoustic and visual display means adapted to be mounted on an automobile body readily visible from a distance and operable from the battery of said automobile, said acoustic and visual display means having an electric circuit system connected to the battery of said automobile for receiving energization current therefrom through a continuously-

repeating current interrupter disposed in the circuit of said electric circuit system, a plurality of normally-open current-switching means connected theretogether in electrically parallel relations in said electric circuit system, and electric receptacles disposed on the dashboard of said automobile and connected to said electric circuit system in open-circuit relation thereto; said plurality of normally-open current-switching means being disposed in the seating area of said automobile at various readily-accessible points thereof, whereby when any one of said plurality of normally-open current-switching means is actuated to a closed-circuit position during an emergency situation within said automobile, said acoustic and visual display means becomes energized for alerting passerbys, police, and the like that the automobile occupant is in need of immediate help, by repetitive acoustic and visual signalling thereof; a position-sensitive switch means having a housing with said position-sensitive switch means sealed therein, said housing being adapted to be carried in a shirt pocket of the automobile occupant and positioned in said shirt pocket in an upright, vertical plane and in an open-circuit position thereof; said position-sensitive switch means being provided with electric conductors extending from the housing thereof and terminating in a connector means adapted to be inserted into one of said electric receptacles, whereby when said position-sensitive switch means is closed as by tilting thereof, with respect to the vertical plane of said automobile, resultant from the occupant's body declination due to sudden attack of illness thereof, said acoustic and visual display means projects a repeating visual distress signal therefrom and sounds an alarm in synchronism with said repeating distress signal to bring help to the occupant; and, a headwear means, adapted to be worn by the automobile driver, having therein an open-circuit position-sensitive switch means and an alarm means electrically coupled thereto in series relation thereof, said open-circuit position-sensitive switch means having a dual-wire cable with a plug member at the termination thereof for insertion into the other of said plurality of open-circuit electric receptacles, whereby when the wearer's head of said headwear means tilts, due to drowsiness during driving, with respect to the vertical plane of the automobile said position-sensitive switch means tilts therewith and closes the circuit to said alarm means in said headwear, causing a current to flow from said battery through said current interrupter to the alarm means in said headwear means, whereupon a repetitive acoustic signal is produced by said alarm means to arouse the driver.



3,947,816

OMNIDIRECTIONAL OPTICAL SCANNING APPARATUS

Melbourne Edward Rabedeau, Saratoga, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed July 1, 1974, Ser. No. 484,479
Int. Cl.² G06K 7/14
U.S. Cl. 340—146.3 Z **14 Claims**

1. Omnidirectional optical scanning apparatus for scanning bar coded labels, comprising

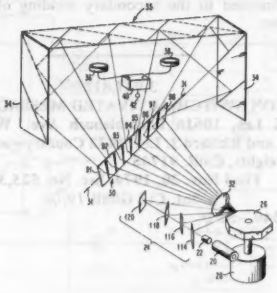
an elongated scanning window at which said labels are presented in random orientation,

optical means for generating a beam of light,

optical means arranged with respect to said generating means for deflecting said beam of light along a line in a given plane intersecting the plane of said scanning window at a predetermined angle to the longitudinal axis of said window,

optical means interposed between said deflecting means and said scanning window for dividing said deflected beam of light along said line into scanning segments and offsetting said segments with respect to each other intersecting the plane of said scanning window at the same predetermined angle for producing a multiple of scans across said scanning window, and

optical means intercepting a portion of said deflected light beam scanning segments and reflecting the intercepted scanning segments over to and intersecting the other scanning segments within said scanning window.

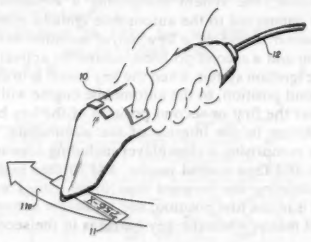


3,947,817

HAND OPERATED OPTICAL CHARACTER RECOGNITION WAND

Stanley C. Requa, deceased, late of Northridge, Calif., and by Recognition Equipment, Inc., Irving, Tex., assignors to Recognition Equipment Incorporated, Irving, Tex.

Filed Apr. 22, 1974, Ser. No. 462,742
Int. Cl.² G06K 9/00, 7/10; G08C 9/06
U.S. Cl. 340—146.3 MA **10 Claims**



1. A system for optically reading alphanumeric characters including a hand held wand, the combination comprising:

a large scale integrated circuit two dimensional array of light sensitive elements in said hand held wand and having a multiple element width and spaced optically to span the widest of said characters and having an element height about three times the element width to produce output signals as said array moves across a field on which alphanumeric characters may appear,

means for scanning each element in said array at a scan rate to generate more than one complete set of output signals of a character on the field,

a character recognition logic matrix responsive to successive subsets of each complete set of output signals from said array,

means to shift successive subsets of output signals from said array through said recognition logic matrix at a shift rate greater than the scan rate to simulate vertical movement of said wand across the field, and

control means to cause said recognition logic matrix to attempt recognition of a character at the shift rate for all successive subsets of a character on the field.

7. A method of reading alphanumeric characters by means of a hand held wand, comprising the steps of:

moving an optical scan array along a line of alphanumeric characters to optically sense the black/white variations of a character on said line,

generating a multiplicity of successive two dimensional sets of black/white signals in a time interval that said wand moves a distance less than that spanned by one of said characters,

shifting subsets of each successive two dimensional sets of signals through recognition logic in a time interval much less than the first time interval in steps and in a direction to simulate vertical movement of said array relative to a character, and

attempting character recognition of subsets in the recognition logic each time signals are shifted relative to said logic.

3,947,818
BUS-COUPLER

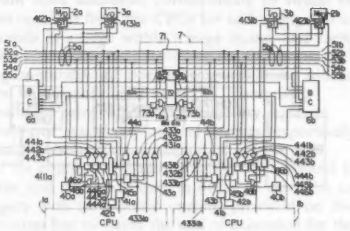
Yoshiki Kobayashi; Tadaaki Bandoh, and Toshitaka Hara, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 9, 1974, Ser. No. 531,161

Claims priority, application Japan, Dec. 14, 1973, 48-138610

Int. Cl.² H04Q 9/00

U.S. Cl. 340—147 LP **4 Claims**



1. A bus-coupler in an information transport system for connecting a plurality of buses, to each of which a plurality of arithmetic units, a plurality of storage units and a plurality of input-output units are connected through respective associating stations, comprising:

first means provided for each of the buses for generating a first signal in response to an inter-bus communication request signal from one of the associating stations of each of the buses;

second means generating a second signal requiring occupation of one of the other buses in response to the first incoming first signal from one of said first means of the one bus and for generating third signals rejecting the inter-bus communication request signal from respective ones of the associating stations of the other buses in response to the succeedingly incoming first signals from others of said first means of the other buses, and when at least two of the first signals occur simultaneously, said second means generating a second signal requiring occupation of one of the other buses in response to one of the at least two first signals from one of said first means of the one bus and also generating third signals rejecting the inter-bus communication request signals from respective ones of the associating stations of the other buses in response to the others of the at least two first signals from others of said first means of the other buses;

third means for interconnecting the one bus with the one of other buses in response to the second signal from said second means; and

fourth means provided for each of the buses for cancelling the inter-bus communication request signals from the respective ones of the associating stations of the other buses in response to the third signals from said second means.

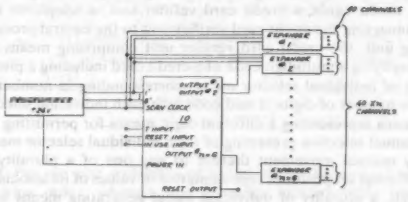
3,947,819
APPARATUS FOR EXPANDING CHANNEL OUTPUT CAPACITY

William R. Wells, Linwood, N.J., assignor to United Audio Visual Corporation, Las Vegas, Nev.

Filed Dec. 31, 1974, Ser. No. 537,724

Int. Cl.² H04Q 5/00

U.S. Cl. 340—147 P **20 Claims**



1. Apparatus for expanding the channel output capacity of a programmer having a plurality of output channels for controlling the states of a plurality of channel expander devices, said programmer including a Scan Clock, means for automatically reading stored information at a preselected rate set by said Scan Clock, and means of generating information in said plurality of programmer output channels indicative of such stored information, comprising:

means for generating a first enabling signal;

means for detecting information in the output channels of said programmer in response to said first enabling signal and for generating a set of output signals in response to said programmer output channel information;

timing means for generating a first timing signal in response to said Scan Clock;

first means connected to said detecting means and said timing means for storing said set of output signals in response to said first timing signal;

means for generating a second enabling signal in response to said Scan Clock; and

means connected to said first storage means and to said second enabling signal generating means for energizing one of said channel expander devices in response to said stored set of output signals and said second enabling signal.

3,947,820
CREDIT CARD VERIFIER

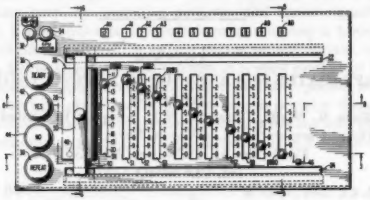
Kenneth M. Goldberg, 361 Main St., Malden, Mass. 02148

Continuation of Ser. No. 210,272, Dec. 20, 1971, Pat. No. 3,823,308, which is a continuation of Ser. No. 880,265, Nov. 26, 1969, abandoned. This application May 20, 1974, Ser. No. 471,693

The portion of the term of this patent subsequent to July 9, 1991, has been disclaimed.

Int. Cl.² G06K 5/00

U.S. Cl. 340—149 A **1 Claim**



1. A credit card verification system wherein the status of a credit card identified by a multidigit code is verified comprising a central processing unit for storing the status of a plurality of credit cards, a credit card verifier unit, a telephone line connecting the credit card verifier unit to the central processing unit, the credit card verifier unit comprising means for veryifying a multidigit code of a credit card including a plurality of individual selector means corresponding in number to the number of digits in said code with each individual selector means representing a different digit, means for permitting the manual selective presetting of each individual selector means by manual movement thereof to any one of a plurality of different set positions representative of values of its associated digit, a plurality of individual signal generating means each associated with a different digital value and operative in response to said individual selector means for generating a different signal for each value, and means for manually sequentially further moving said plurality of preset selector means after the presetting thereof for sequentially operating said individual signal generating means thereby generating signals in sequence and value determined by presetting of said individual selector means.

3,947,821
MICROPROGRAMMING APPARATUS AND METHOD

Ginette Laure Dalmasso, Bagnolet, France, assignor to Compagnie Honeywell Bull, Paris, France

Filed Oct. 18, 1974, Ser. No. 515,905

Claims priority, application France, Oct. 24, 1973, 73.37868

Int. Cl.² G06F 9/16

U.S. Cl. 340—172.5 **12 Claims**

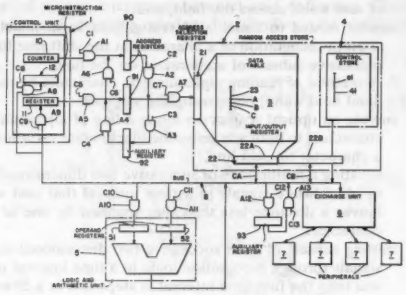
1. A method of recording and carrying out microprograms in a processor associated with a data processing system in which a microprogram recorded in a read/write store belonging to the processor contains microinstructions which are to be carried out sequentially with the aid of a data table store, comprising the steps of:

providing a storage location for a parameterized microinstruction containing a first parameter and a second parameter at a predetermined address in the read/write store;

storing in the data table store a first value corresponding to the first parameter and a second value corresponding to the second parameter;

combining the first and second values extracted from the data table store to form a calculated microinstruction;

storing the calculated microinstruction in the read/write



store at the predetermined address; and

executing the calculated microinstruction.

3,947,822
PROCESSOR OF MICRO-COMPUTER WITH DIVISION OF MICRO-INSTRUCTION

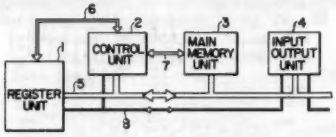
Kazuo Watanabe, Kokubunji, and Nobuo Hamamoto, Hachioji, both of Japan, assignors to Hitachi, Ltd., Japan

Claims priority, application Japan, Mar. 16, 1973, 48-30099

Filed Mar. 18, 1974, Ser. No. 452,272

Int. Cl.² G06F 9/16

U.S. Cl. 340—172.5 **10 Claims**



1. A micro-computer having a control unit and an operation unit,

said control unit comprising:

a read only memory for storing a plurality of micro instructions,

first means, coupled to said read only memory, dividing a micro instruction read out therefrom into a plurality of stages, each of which corresponds to a fundamental unit for controlling said operation unit, and

second means, coupled to said first means, for transmitting the micro instructions divided into respective stages to said operation unit in a time-shared format;

said operation unit comprising:

third means, coupled to said second means, for storing micro instructions transmitted from said control unit according to the fundamental units into which the instructions are divided;

fourth means, coupled to said third means, for decoding the stored micro instructions, and

fifth means, coupled to said fourth means, for effecting the execution of the decoded micro instructions in a manner to partially overlap in time.

3,947,823

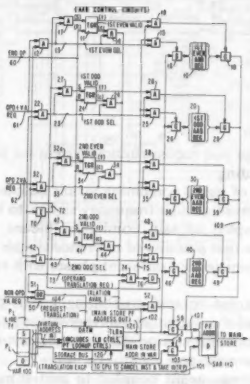
MEANS FOR COORDINATING ASYNCHRONOUS MAIN STORE ACCESSES IN A MULTIPROCESSING SYSTEM USING VIRTUAL STORAGE

Andris Padegs, Poughkeepsie, and Ronald Morton Smith, Wappingers Falls, both of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Dec. 26, 1973, Ser. No. 428,276

Int. Cl.² G06F 9/18

U.S. Cl. 340—172.5 **4 Claims**



1. Apparatus for maintaining operand addressability to a page frame in a main store for current instructions in CPUs of a multiprocessing system using virtual storage addressing and demand-paging interruptions, in which each CPU has a virtual address register and an address translation means which provides main store addresses correspondng to virtual storage addresses received from the CPUs for addressing and accessing operands in a page within a page frame; and each CPU having lines for electrically signalling the CPU's requirements including a plurality of operand request lines, and an end operation line, apparatus in each CPU comprising

a plurality of pairs of address availability registers,

a plurality of availability control triggers respectively provided for the address availability registers,

means for connecting a reset input of each control trigger to the end operation line, in order to reset the control triggers with an electric current provided on the end operation line to signal the end of execution for the current instruction,

means for gating into a selected one of the availability registers a main store address provided by the address translation means,

the virtual address register containing a page component with a low-order bit position, true and inverted output lines provided from the low-order bit position, the output of the virtual address register being connected to the input of the address translation means, a main store address register receiving the output of the translation means, a displacement component of the virtual address register being connected to a displacement component of the main store address register,

a plurality of pairs of AND circuits, in which both AND circuits in each pair have inputs connected to a respective one of said plurality of operand request lines, one AND circuit in each pair also having an input connected to the true output line and the other AND circuit in the same pair also having an input connected to the inverted output line, and means for connecting the output of each AND circuit to a gating means at an input of a respective one of said address availability registers while the respective control trigger is in a reset state,

means for connecting a set input of a respective one of said availability control triggers to the output of a respective one of the AND circuits,

second gating means respectively connecting outputs of said availability registers to a main store address register, and the second gating means having an input conditioned by the set state of an associated control trigger.

3,947,824

PRIORITY CONTROL CIRCUIT

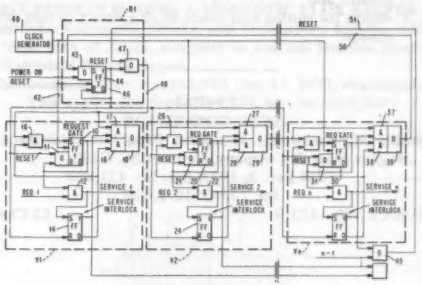
Lothar A. Doehle, Herrenberg; Heinz Drescher, Holzgerlingen; Hans H. Lampe, Herrenberg; Werner Pohle, Doeffingen, and Peter Rudolph, Schoenaich, all of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 17, 1974, Ser. No. 479,734

Claims priority, application Germany, July 21, 1973, 2337159

Int. Cl.² G06F 9/18

U.S. Cl. 340—172.5 **4 Claims**



1. For use with a plurality of system elements arranged in a ranking order, wherein said elements independently issue request signals for service, a priority circuit comprising:

means for cyclically scanning said request signals in a sequence determined by said ranking order;

means responsive to said scanning means in each scan cycle for granting service to the first element in the ranking order which emits a request signal;

plural interlock means associated with individual said elements and activated to energized condition from unenergized condition by said service granting means, for selectively bypassing said request signal of each said first element when energized; and

means responsive to said interlock means for causing said scanning means to reinitiate the cycle of scanning of said request signals, starting at the beginning of said sequence determined by said ranking order and skipping over requests having associated interlocks energized, when service is granted to one of said request signals.

3,947,825

ABSTRACTING SYSTEM FOR INDEX SEARCH MACHINE

Thomas Edward Cassada, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 350,880, April 13, 1973, which is a continuation-in-part of Ser. No. 157,565, June 28, 1971. This application May 7, 1975, Ser. No. 575,318

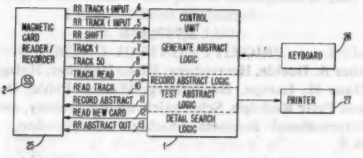
Int. Cl.² G06F 1/00

U.S. Cl. 340—172.5 **57 Claims**

1. Apparatus for generating at least one abstract that is useful during information searching and retrieval procedures, comprising:

1. means for sensing information comprising individual words in a selected language, each word comprising one or more individual characters;

2. means for categorizing selected ones only of the characters in said words into predefined character groups that are based on a probability distribution of characters in the language selected;



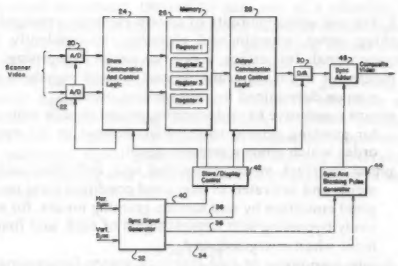
3. means maintaining a count of the number of characters categorized into each of said predefined character groups; and
4. means for storing said count as an abstract of said information.

3,947,826

SCAN CONVERTOR

Walter H. Bockwoldt, Woodland Hills, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 3, 1973, Ser. No. 421,880
Int. Cl.[2] G11C *13/00*
U.S. Cl. 340—173 R **12 Claims**



1. The method of transforming first data groups each comprising sequentially applied set of lines of parallel channel data having a first time base, into second data groups each of which contains the same information content as the corresponding first data group and is comprised of lines of single channel data having a second time base which is different from said first time base, said method comprising the steps of:

storing alternate sets of lines of parallel channel data of the first data group in alternate ones of a pair of memory sections such that different ones of said pair of memory sections are loaded with data during alternate processing periods; and

sequentially reading out a preselected plurality of times and at said second time base each of the lines of data of the set stored during the last preceding processing period;

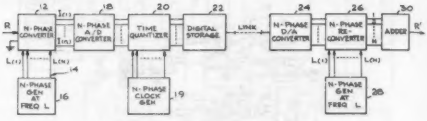
whereby the data read from said memory sections forms said second data group.

3,947,827

DIGITAL STORAGE SYSTEM FOR HIGH FREQUENCY SIGNALS

Joseph L. Dautremont, Jr., Northridge, and William J. Schneider, Glendale, both of Calif., assignors to Whittaker Corporation, Los Angeles, Calif.

Filed May 29, 1974, Ser. No. 474,245
Int. Cl. G11c *21/00*
U.S. Cl. 340—173 RC **33 Claims**



1. A storage and reconstruction system for high frequency signals, including:

a plurality of signal combining means adapted for the coupling thereto of high frequency signals to be stored;

means coupled to said combining means for supplying thereto a first plurality of reference signals having identical frequencies but different phases with respect to each other;

means coupled to said combining means for converting certain of the output signals therefrom to digital signals;

storage means for storing the digital signals from said converting means; and

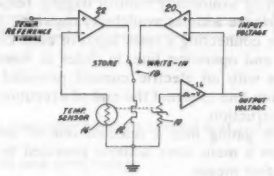
reconstruction means coupled to said storage means for reproducing said high frequency signals.

3,947,828

ANALOG MEMORY SYSTEM USING A TEMPERATURE SENSITIVE DEVICE

Robert S. Meijer, Montreal, Canada, assignor to Multi-State Devices, Ltd., Dorval, Canada

Filed Feb. 11, 1975, Ser. No. 549,058
Claims priority, application Canada, Nov. 12, 1974, 213521
Int. Cl.[2] G11C *27/00, 15/00, 11/56*
U.S. Cl. 340—173 R **5 Claims**



1. An analog memory system comprising:

a. a temperature sensitive device exhibiting a significant hysteresis centered about a predetermined transition temperature and a significant impedance change about said transition temperature to allow discrimination of a large number of identical temperature impedance levels;

b. means for adjusting the temperature of said temperature sensitive device to write-in an input signal to be stored in the form of a predetermined impedance of said temperature sensitive device;

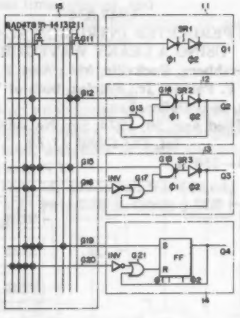
c. means for subsequently adjusting the temperature of said temperature sensitive device at said transition temperature to store said input signal; and

d. a converter for converting the impedance of said temperature sensitive device to an analog of the signal stored in the memory system.

3,947,829
LOGICAL CIRCUIT APPARATUS

Yasoji Suzuki, Kanagawa, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Japan

Filed July 22, 1974, Ser. No. 491,477
Claims priority, application Japan, July 24, 1973, 48-83302
Int. Cl.² G11C 17/00
U.S. Cl. 340—173.5 P 7 Claims

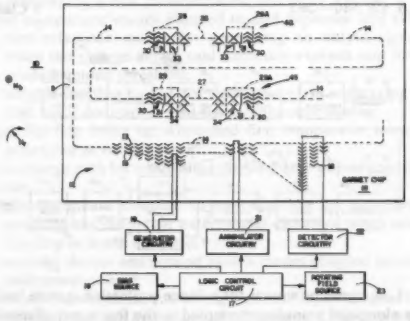


7. A logical circuit apparatus comprising a plurality of logical control circuits each having either a delay circuit or a storage circuit driven by a writing-in clock pulse $\phi 1$ and a reading-out clock pulse $\phi 2$ supplied thereto, a logical gate circuit supplied with a plurality of input signals and constituted by a plurality of main logical gates each supplied with at least one of said input signals and a plurality of auxiliary logical gates each supplied with at least prescribed one of said input signals which contain a frequency component different from that of said clock pulses $\phi 1$ and $\phi 2$, and a plurality of logical control gate circuits respectively included in prescribed ones of said logical control circuits and connected correspondingly to each of said auxiliary logical gates, for making a logical control of an output from the corresponding logical gate in accordance with an output from a corresponding one of said auxiliary logical gates and a feedback signal from said logical control circuit.

3,947,830
COMPLEMENTARY TRANSITION STRUCTURES FOR MAGNETIC DOMAIN PROPAGATION

Peter K. George, Placentia, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 27, 1974, Ser. No. 455,176
Int. Cl.² G11C 11/14
U.S. Cl. 340—174 TF 6 Claims



1. A magnetic domain device, comprising:

a layer of magnetic material in which single wall domains can be moved;

a patterned arrangement of magnetically soft elements in juxtaposition to said layer and responsive to a cyclically varying magnetic field in the plane of said layer to form at least a pair of channels for moving domains, said pair of channels having adjacent end portions;

the first of said pair of channels comprising adjacent columns of chevron-shaped elements, one column thereof defining the first of said adjacent end portions;

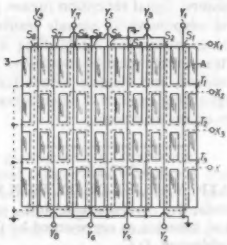
the second of said pair of channels comprising adjacent columns of X or T-X elements, one column thereof defining the second of said adjacent end portions; and

at least one magnetically soft element interposed between said adjacent end portions of said pair of channels for transferring domains between said adjacent end portions within one period of the pattern as established by one period of said cyclically varying magnetic field.

3,947,831
WORD ARRANGEMENT MATRIX MEMORY OF HIGH BIT DENSITY HAVING A MAGNETIC FLUX KEEPER

Toshihiko Kobayashi, Mitaka, and Tetsusaburo Kamibayashi, Niza, both of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Continuation of Ser. No. 313,993, Dec. 11, 1972, abandoned.
This application Sept. 23, 1974, Ser. No. 508,288
Int. Cl.² G11C 11/155
U.S. Cl. 340—174 BC 6 Claims



1. A high bit density word arrangement matrix memory comprising:

a flat substrate of insulating material;

a plurality of straight sections of parallel digit lines disposed in parallel at regular intervals on a flat surface of the flat substrate, each of the digit lines comprising a conductive strip and at least one ferromagnetic thin film disposed thereon, corresponding digit lines of the respective straight sections being interconnected to one another;

a magnetic flux keeper plate of magnetic material having a plurality of parallel column grooves and a plurality of parallel row grooves intersecting at right angles with the parallel column grooves, the magnetic flux keeper plate being mounted on the flat substrate so that the column grooves and the row grooves are adjacent the flat surface of the flat substrate;

a plurality of X conductors each disposed in a corresponding adjacent pair of the row grooves and having portions disposed in the segments of all the column grooves between said corresponding adjacent pair of row grooves so that each of the portions of the X conductors disposed in said segments of the column grooves overlies a corresponding one of the straight sections of the digit lines; and

a plurality of Y conductors each disposed in at least a corresponding one of the column grooves.

3,947,832

SYSTEM FOR PROTECTING PERSONS UNDERGROUND FROM DANGEROUS AREAS

Karl Rösgen, Essen-Heisingen, and Klaus Noack, Essen-Kray, both of Germany, assignors to Bergwerksverband GmbH, Essen, Germany

Filed May 20, 1971, Ser. No. 145,199

Claims priority, application Germany, May 29, 1970, 2026167; May 29, 1970, 2026168

Int. Cl.² G08B 1/08

U.S. Cl. 340—224 17 Claims

1. A system for protecting persons engaged in underground operations from danger areas, comprising in combination a plurality of miner's head lamps; a plurality of continuously operating signal transmitters each connected to a respective one of said miner's head lamps in such a manner that when the head lamps are worn the signal transmitters must be carried along by the wearers; signal reception means positioned at a danger area and responsive to signals transmitted by said signal transmitters; means for establishing a definite zone within which a transmitter must be located to be detected by said reception means; and electric means for automatically initiating a safeguarding operation when a respective one of said transmitters enters said zone.

3,947,833

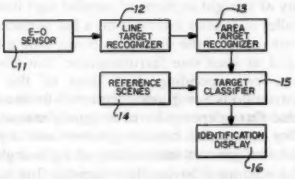
AUTOMATIC TARGET DETECTION SYSTEM

Royal W. Eckstein, Jr., Indianapolis, Ind., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 20, 1974, Ser. No. 526,570

Int. Cl.² G01D 21/04; G06K 9/00; H04N 3/00; G01B 9/21

U.S. Cl. 340—258 R 5 Claims



1. A device for recognizing a swimmer in water comprising,

an electro-optical sensor providing a video display for viewing a target in water,

first means for measuring the contrast of said target and assigning a first probability factor that said target is not a swimmer and measuring the width of said target and assigning a second probability factor that said target is not a swimmer,

second means for encoding an area containing a target when said first means determines that said target has a probability of being a swimmer, said encoded target area being a portion of said video display,

memory means for retaining said encoded target area,

means providing reference scenes characteristic of a swimmer, and

classification means for comparing said encoded target area with said reference scenes for determining whether said target is a swimmer.

3,947,834

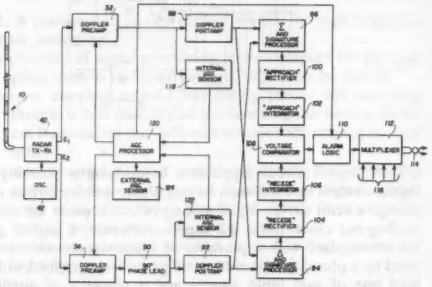
DOPPLER PERIMETER INTRUSION ALARM SYSTEM USING A LEAKY WAVEGUIDE

David N. Gershberg, Rockville, Md.; Alex Y. Lee, Arlington, and Clair F. Parker, Jr., Fairfax, both of Va., assignors to E-Systems, Inc., Dallas, Tex.

Filed Apr. 30, 1974, Ser. No. 465,677

Int. Cl.² G08B 13/18

U.S. Cl. 340—258 A 28 Claims



1. An antenna for use with a system for detecting motion through a perimeter, comprising in combination:

a center conductor extending to define a perimeter of interest and having one end arranged to be connected to the motion detecting system and energized by an excitation frequency; and

an outer conductor coaxially spaced with respect to the center conductor,

said outer conductor including a plurality of groups of radiation slots to expose the center conductor and thereby enhance radiation along the outer conductor,

the groups spaced along the outer conductor at distances related to the excitation frequency of the motion detecting system.

3,947,835

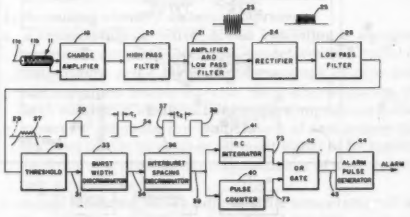
FENCE PROTECTION SYSTEM

Marvin D. Laymon, Milpitas, Calif., assignor to GTE Sylvania Incorporated, Mountain View, Calif.

Filed July 1, 1974, Ser. No. 484,434

Int. Cl.² G08B 13/02

U.S. Cl. 340—261 9 Claims



1. A signal processor for a fence protection system having an elongated transducer coupled to the fence and adapted to produce an electrical signal output comprising a succession of

signal bursts in response to vibrations induced in the fence, said processor comprising

means responsive to the output of said transducer for passing as separate bursts successive bursts having an interburst time spacing greater than a predetermined interval, and passing as a single burst successive bursts having other interburst spacings.

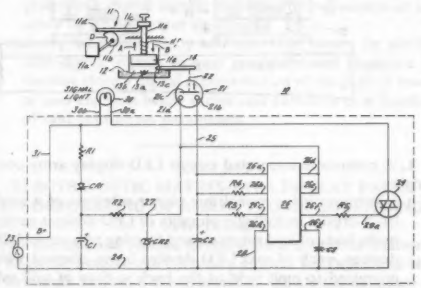
means for counting said passed bursts and producing an output after counting a predetermined number of bursts within a preset time interval, and

alarm means responsive to the output of said counting means for producing an alarm.

3,947,836
ELECTRONIC PRESSURE CYCLE INDICATOR

Carl H. Smith, Spring Valley, N.Y., and August X. Sidler, Cham, Switzerland, assignors to Auto Research Corporation, Rochelle Park, N.Y.

Filed Oct. 25, 1974, Ser. No. 518,041
Int. Cl.² F01M *1/20*; G08B *21/00*
U.S. Cl. 340—270 **7 Claims**



1. In a lubricating system for lubricating apparatus and having a source of lubricating fluid; conduit means for coupling said lubricant to said apparatus; means for periodically and cyclically dispensing lubricant from said source to said conduit means, the improvement comprising a circuit for providing a warning indication in cases where lubricant dispensing is terminated for abnormal and/or prolonged time periods, said circuit comprising:

a capacitor;

a power source;

first switch means activated by the presence of lubricant in said conduit means for coupling said capacitor to said power source;

first reference means coupled to said power source for establishing a first predetermined threshold voltage;

first comparator means coupled to said capacitor and said first reference means for generating an output signal when the voltage across said capacitor exceeds said first predetermined threshold;

a bistable flip-flop having a set and reset state and having a first input coupled to said first comparator means;

said flip-flop being set when said first comparator means generates an output signal;

a discharge path for controlling the discharge of said capacitor;

discharge means coupled to said flip-flop for providing coupling the discharge path to said capacitor when said flip-flop is in the set state;

a warning device and second switch means coupled across said power source;

said second switch means having a control input coupled to said flip-flop and being turned off when said flip-flop is in the set state;

second means coupled to said power source for developing a second predetermined threshold;

second comparator means coupled to said second means and said capacitor for developing an output signal when the voltage across said capacitor drops below said second predetermined threshold;

said flip-flop having a second input coupled to said second comparator means and being driven to the reset state when said second comparator means develops an output signal;

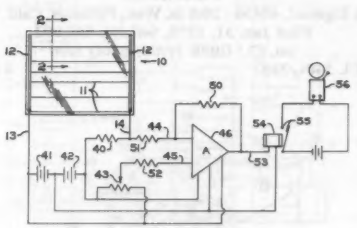
said discharge means being rendered non-conductive when said flip-flop is driven to the reset state;

said second switch means being turned on when said flip-flop is in the reset state causing activation of said warning device.

3,947,837
SECURITY GLAZING AND ALARM SYSTEM

Michael G. Bitterice, New Kensington, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 7, 1974, Ser. No. 495,469
Int. Cl.² G08B *13/00*
U.S. Cl. 340—274 R **15 Claims**



1. A security glazing system comprising:

a resistance grid formed by a plurality of frangible, electrically conductive wires electrically in parallel with one another and extending across an area to be protected;

means for applying a voltage across said grid; and

circuit means connected across said grid, including resistance balancing means for comparing the resistance of said grid with a reference resistance and for generating an output signal in response to an incremental change in the grid resistance corresponding to a break in one or more of said wires in the grid, said resistance balancing means being provided with adjustment means for resetting the system by re-establishing a resistance balance in the circuit while a portion of the grid wires are broken.

3,947,838
INTRUSION ALARM SYSTEM

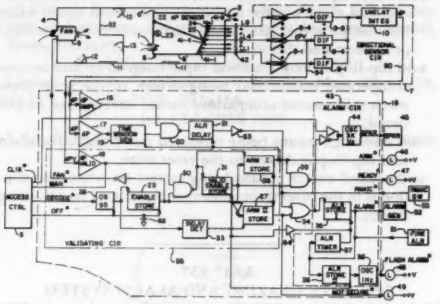
Louis H. La Forge, Jr., San Mateo, Calif., assignor to Tri-Century Industries, San Mateo, Calif.

Filed Oct. 29, 1974, Ser. No. 518,602
Int. Cl.² G08B *13/20*
U.S. Cl. 340—276 **24 Claims**

1. An intrusion detection apparatus for detecting intrusions into an enclosure wherein a pressure differential in a medium is maintained between the enclosure and the external environment, the improvement comprising:

sensor means connected between the enclosure and the external environment for providing an electrical signal which varies over a plurality of values within the extreme values of a range as a function of changes in the differential pressure between the enclosure and the external environment,

signal processing means for detecting predetermined properties in said electrical signal to distinguish between intru-



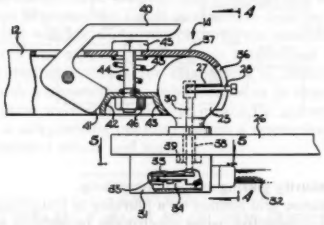
sion-caused changes and non-intrusion-caused changes in said differential pressure.

3,947,839

TRAILER ANGULAR DIRECTION SENSOR AND INDICATOR

Frank Zigmant, 40436 - 20th St. West, Palmdale, Calif. 93550

Filed Jan. 31, 1975, Ser. No. 546,092
Int. Cl.² G08B *21/00*; B60Q *1/00*
U.S. Cl. 340—282 **4 Claims**



1. A trailer angular direction indicator comprising the combination of:

a releasable hitching device interconnecting the rear of a towing vehicle with the draw bar of a trailer;

a sensing means operably connected on said hitching device for detecting angular displacement of said trailer with respect to said towing vehicle;

an indicator means operably connected to said sensing means including display means for presenting a visual indication of said angular displacement and the direction of said angular displacement with reference to increasing and decreasing of said angular displacement;

wherein said sensing means includes: a sensing arm rotatably carried on said towing vehicle;

a portion fixedly carried on the draw bar of said trailer insertably receiving said sensing arm in a slot of said portion so that said sensing arm follows the said angular displacement of said trailer with respect to said towing vehicle;

said sensing means further includes a wiper contact arm carried on said sensing arm and a plurality of wiper contacts fixed with respect to said wiper contact arm whereby the width of the contact carried on said wiper arm is at least equal to the width of one fixed contact plus approximately two and one half times the width of space separating adjacent ones of said fixed contacts;

said indicator means includes a plurality of lights whereby a centermost light represents coextensive centerlines of said trailer and said towing vehicle;

said hitching device includes a ball carried on said towing vehicle and said sensing arm is rotatably carried thereon; and

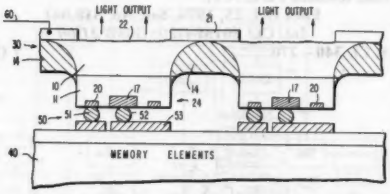
said ball includes a horizontal slot for accommodating rotation of said sensing arm.

3,947,840

INTEGRATED SEMICONDUCTOR LIGHT-EMITTING DISPLAY ARRAY

Magnus George Craford, St. Louis, and Paul T. Bailey, Creve Coeur, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Aug. 16, 1974, Ser. No. 497,992
Int. Cl.² G08B *5/36*
U.S. Cl. 340—324 M **15 Claims**



1. A composite integrated circuit LED display array comprising:

a light-transmissive monolithic planar substrate of a single III–V crystal including a plurality of LED devices carried in the body of said substrate and forming an array of LED devices, each of said LED devices being adapted when energized to emit light at the back surface of said substrate, said LED devices being optically isolated from one another, the optical isolation being affected by a light-absorbing doped region between said LED devices, said doped region being adapted to absorb light emitted by the individual LED devices, each of said LED devices being constituted by at least one diode having a separate p-n junction at which said light is radiated, said junction being at the back surface of said crystal, said light being transmitted through said crystal for being observed at the front surface of said crystal;

a monolithic integrated circuit array of circuit elements corresponding to and adapted for energizing respective ones of said LED devices, said integrated circuit array being adjacent the back surface of said crystal; and

interconnection means sandwiched between said arrays for providing electrical interconnections between respective ones of said LED devices and circuit elements at said back surface, said circuit elements being selectively operable for independently energizing corresponding ones of said LED devices to emit light at said back surface, said light being transmitted through said substrate for being observed at the front surface of said substrate.

3,947,841

CHANNEL ELECTRON MULTIPLIER SIGNAL DETECTOR AND DIGITIZER

Thomas A. Tumolillo, Woodbridge, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

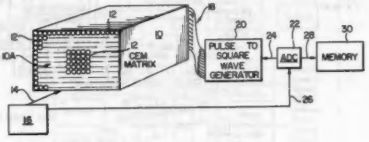
Filed Aug. 28, 1973, Ser. No. 392,375
Int. Cl.² G08B *23/00*
U.S. Cl. 340—324 M **8 Claims**

1. Means for digitizing oscilloscope traces of transient waveforms and the like defined by the path of travel of an electron beam, comprising:

oscilloscope means having a predetermined scan rate generating said electron beam, said oscilloscope having a main envelope;

a plurality of channel electron multipliers within said main envelope having anodes and cathodes with said cathodes arranged in a substantially planar array defined by coordinate parameters in the path of said electron beam;

a stable output responsive means at each of said anodes generating an output signal in response to the impingement of said electron beam on a corresponding cathode;



converter means for strobing said output responsive means to sample said output signals in a predetermined sequence correlated to said coordinate parameters and generating digital signals indicating the presence or absence of a said output signal; and

memory means driven by said converter means for storing said digital signals in said predetermined sequence to thereby store a digital representation of the path of travel of said electron beam across said cathodes as a function of said coordinate parameters.

3,947,842

ELECTRO-OPTIC MATRIX-TYPE DISPLAY PANEL INCORPORATING OPTOELECTRONIC ADDRESSING SWITCHES

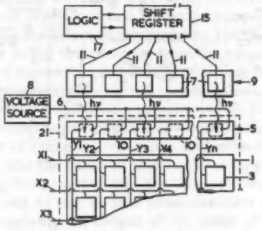
Cyril Hilsum, and Adrian Leonard Mears, both of Malvern, England, assignors to Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed May 20, 1974, Ser. No. 471,825

Claims priority, application United Kingdom, May 23, 1973, 24566/73

Int. Cl.² G06F *3/14*

U.S. Cl. 340—324 R **9 Claims**



1. An electro-optic display system comprising a panel incorporating a matrix of rows and columns of display elements each capable of producing an optical display signal in response to electrical operating energy, a series of row addressing conductors electrically connected to those of said display elements in each row of said matrix, a series of column addressing conductors electrically connected to those of said display elements in each column of said matrix, a separate channel to each separate addressing conductor belonging to one of said series of addressing conductors, each of said channels comprising a photosensitive element for the purpose of opening the channel in which that photosensitive element is incorporated for a given period to enable electrical operating energy to be applied during the given period via the channel to an appropriate one of said addressing conductors, a generator of electro-magnetic radiation signals arranged to irradiate in response to electrical control signals selected ones of said photosensitive elements and a generator of electrical control signals arranged to feed electrical control signals to said generator of electromagnetic radiation signals, wherein said photosensitive elements are defined by a linear structure of photosensitive material deposited on said panel adjacent but distinct from said matrix of display elements and wherein a conductor structure for connecting said photosensitive elements to a source of electrical operating energy is deposited on said panel symmetrically with respect to said linear structure.

3,947,843

ARRANGEMENT FOR PREVENTING AMBIGUITY IN DIGITAL DISPLACEMENT MEASURING APPARATUS

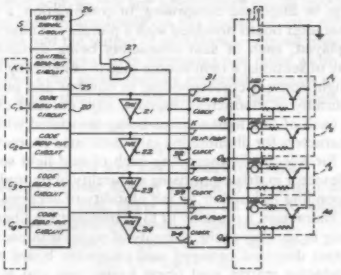
Shelley M. Presentey, 1268 Henry Farm Drive, Ottawa K2C2E2, Canada

Filed Mar. 30, 1973, Ser. No. 346,702

Claims priority, application Canada, Feb. 5, 1973, 162851

Int. Cl.² H03K *13/00*

U.S. Cl. 340—347 P **15 Claims**

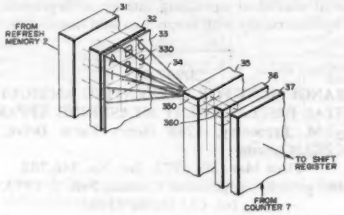


1. Displacement measuring apparatus for measuring displacement in a predetermined direction of a first element relative to a second element, comprising, in combination, code display means coupled to said first element, said code display means having a plurality of digital code markings each representing a predetermined unit of displacement spaced at predetermined distances from each other in said predetermined direction, said code display means further having control markings arranged in predetermined positions relative to said code markings; read-out means coupled to said second element and comprising code read-out means and control read-out means mounted in predetermined positions relative to each other, for respectively reading out code markings and control markings passing in operative proximity thereto and furnishing corresponding data and control signals; means for providing said control signals only when said code readout means are positioned relative to the central portion of said code markings; output circuit means connected to said read-out means for furnishing output signals corresponding to said data signals only upon receipt of said control signal and for storing said output signals until receipt of the next-subsequent one of said control signals thereby furnishing stored output signals; a plurality of light sources connected to said output circuit means for energization by said stored output signals; camera means for photographing said light sources, said camera means having a shutter and secondary optics for recording said light from said light sources; means for furnishing a shutter signal when said shutter is travelling across said secondary optics; and gating means interconnected between said means for furnishing a shutter signal, said control read-out means, and said output circuit means for furnishing said control signals to said output circuit means only in the presence of said control signals and the absence of said shutter signals.

3,947,844
APPARATUS FOR GENERATING SIGNALS CORRESPONDING TO CHARACTERS TO BE DISPLAYED

Hitoshi Miyoshi, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed July 24, 1974, Ser. No. 491,503
Claims priority, application Japan, July 26, 1973, 48-84440
Int. Cl.² G06F 3/14
U.S. Cl. 340—380 **4 Claims**



1. Apparatus for generating signals corresponding to characters to be displayed comprising, in combination, a changeable character board provided with a plurality of characters to be displayed, each of said characters being divided into a plurality of sections, a light source matrix comprising a plurality of light sources corresponding in number and position to said plurality of characters disposed adjacent said character board, each of said light sources being associated with one of said characters for illuminating said associates character only, means for selectively energizing each of said light sources, a photodetector matrix comprising a plurality of photodetectors corresponding in number to the plurality of sections in each of said characters, a plurality of light transmitting fibers corresponding in number to the plurality of sections in each of said characters disposed between said character board and said photodetector matrix, said fibers having one end associated with a section of said characters and the other end with one of said photodetectors for transmitting light signals between said character board and said photodetector matrix, said fibers being arranged in associated groups to interconnect in light transmitting relationship all of the corresponding sections throughout said plurality of characters to one of said plurality of photodetectors, whereby all of the sections in each of said characters are optically connected to all of said photodetectors, character display means, and means for detecting the output of said photodetectors in response to the selective illumination of said characters on said character board to generate signals for displaying said character on said display means.

3,947,845
ALTITUDE CODING FOR COLLISION AVOIDANCE SYSTEM

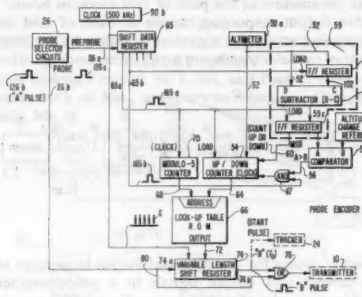
John Jeffrey Lyon, Canoga Park, Calif., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 19, 1974, Ser. No. 462,491
Int. Cl.² G01S 9/56
U.S. Cl. 343—6.5 LC **8 Claims**

1. An encoder for use at an interrogator station to provide an altitude address for transmission to a remote aircraft for reply thereto by the aircraft if the altitude of the remote aircraft corresponds to the address, comprising in combination;

a. means for generating a pair of pulses having spacing between each pulse of said pair of pulses corresponding to a particular altitude address,

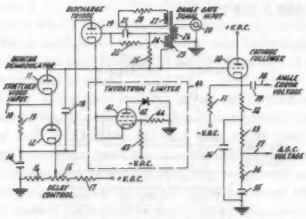
b. means for periodically changing the spacing between said pair of pulses in accordance with a predetermined program to provide a scan of altitudes of predetermined bands, said pulse pair generating means including means for providing said spacing between said pulses in accordance with discrete changes in altitude of said interrogator station that occur during periods of transmission of said pulses, said discrete changes having a value greater than a predetermined value whereby said pulse pair spacing changes in discrete increments only with altitude changes exceeding said predetermined value.



3,947,846
THYRATRON LIMITER RADAR ANTI-JAMMING CIRCUIT

Samuel U. Carnahan, Chadd's Ford, Pa., and James G. Holman, Baltimore, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 29, 1962, Ser. No. 199,569
Int. Cl.² G01S 7/36; H03B 3/02
U.S. Cl. 343—18 E **6 Claims**



1. A limiter circuit for limiting the voltage amplitude of a circuit comprising:

a circuit to be limited with respect to a fixed potential thereof;

an electron emission device having a control electrode and two conduction electrodes, one of said conduction electrodes being coupled to said circuit to be limited and the other of said conduction electrodes being coupled to said fixed potential;

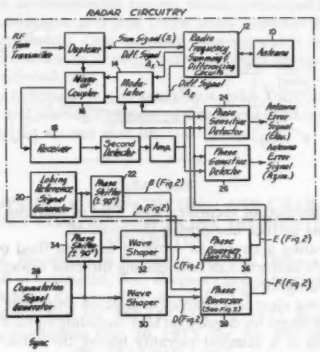
a Zener diode having its anode connected to said other conduction electrode of said electron emission device and its cathode coupled to said fixed potential; and

a voltage biasing source from said fixed potential connected to said control electrode of said electron emission device to establish a voltage amplitude limit for said circuit to be limited.

3,947,847
RADAR SYSTEM

Harry D. Felsenthal, Jr., Camarillo, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 24, 1969, Ser. No. 810,037
Int. Cl.² G01S 7/36, 9/02
U.S. Cl. 343—18 E **3 Claims**



1. In a radar of the type possessing an electronically nutated antenna from the output of which azimuth and elevation difference signals are obtained and applied to a modulator for development of a suppressed-carrier wave which is amplitude-modulated at the nutation frequency and which has an amplitude and phase proportional to the amplitude and direction of antenna boresight error, and in which a lobing reference signal generator develops an elevation lobing reference signal and an azimuth lobing reference signal for application to said modulator and also for respective application to two phase-sensitive detectors in order to generate a pair of antenna error signals, the improvement which comprises

apparatus for improving the target-tracking capabilities of said radar in a pulse-jamming environment, where said pulse jamming is at or near the antenna nutation frequency,

said apparatus including means for periodically reversing the phase of the said two lobing reference signals so as to minimize the effect of any jamming energy which may be present in the return signal from the target,

wherein said means for periodically reversing the phase of the said two lobing reference signals including means for developing a pair of rectangular commutating waves 90° out of phase with one another, a pair of phase reversers, means for applying to the other of said phase reversers said azimuth lobing reference signal and the other of said commutating waves, means for applying the output of said one phase reverser both to said modulator and to one of said phase-sensitive detectors, and means for applying the output of the other of said phase reversers both to said modulator and to the remaining one of said phase-sensitive detectors.

3,947,848
ANTI-JAM DUAL CHANNEL VIDEO CANCELLATION CIRCUIT FOR FIRST TARGET TRACKING SYSTEM

Samuel U. Carnahan, Chadd's Ford, Pa., and Robert N. Longuemare, Jr., Halethorpe, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 7, 1962, Ser. No. 215,473
Int. Cl.² G01S 7/36
U.S. Cl. 343—18 E **9 Claims**

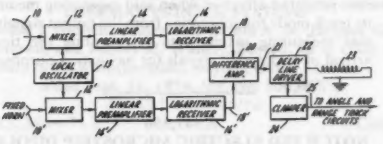
1. A dual channel video cancellation anti-jam circuit of a radar tracking system comprising:

a high gain, narrow beam antenna;

a low gain, wide beam antenna;

a logarithmic receiver channel coupled to each antenna to produce logarithmic functions of received signals on outputs thereof;

a difference circuit coupled to receive the output of both logarithmic receiver channels to subtract the logarithmic function of the signals from the low gain antenna from those of the high gain antenna to produce a difference signal output;



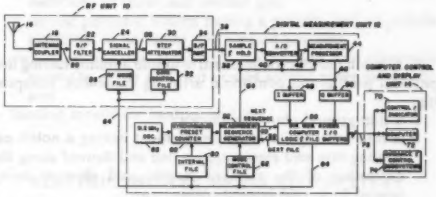
a delay line coupled to said difference circuit output to produce delayed signals on an output thereof; and

a clamper circuit coupled to said delay line output to clamp said delayed signals at a predetermined voltage whereby desired echo signals and interference signals received are equalized in amplitude on the output of said difference circuit and the output of said clamper circuit prevents an interfering signal from appearing one pulse width from a desired echo signal thereby preventing signals to appear that could steal the range gates of a radar system.

3,947,849
LORAN RECEIVER-NAVIGATOR

Leo F. Fehlner, Silver Spring; Thomas W. Jerardi, Columbia, and Ronald G. Roll, Silver Spring, all of Md., assignors to The Johns Hopkins University, Baltimore, Md.

Filed June 20, 1974, Ser. No. 481,409
Int. Cl.² G01S 1/20
U.S. Cl. 343—103 **15 Claims**



1. Apparatus for producing navigation information from the coded signals of an existing network of radio transmitting stations each of which transmits a navigation signal in the form of a pulse group distinctively coded in accordance with the identity of that transmitting station, said apparatus comprising:

receiver means for receiving said transmitted coded navigation signals,

measuring means having search, settle, and track modes connected to said receiver means for making measurements at selected points on the waveform of each of said received coded signals and producing output signals representing the signal in-phase and quadrature amplitudes at said selected points on said signal waveform,

said search mode involving the use of said measurements of said waveform to identify a group of said transmitting stations,

said settle mode involving the use of said measurements of said waveform to locate a track point on the waveform for the received signal from each transmitting station of said station group,

said track mode involving the use of said measurements to adjust the location of said track point on the waveform of said received signal from each transmitting station of said station group, to maintain said track point coincident with the point at which said quadrature amplitude is measured, only if said quadrature amplitude remains within a preselected tolerance between successive pulses of a pulse group,

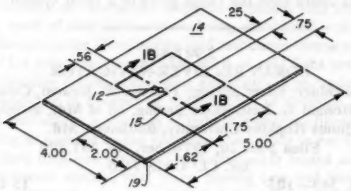
control means responsive to said output signals from said measuring means for selectively switching said measuring means to its search, settle, and track modes, and

means rendered effective when said measuring means is in its track mode for generating from the output signals from said measuring means data demarcating the times of arrival of said coded signals for navigation purposes.

3,947,850
NOTCH FED ELECTRIC MICROSTRIP DIPOLE ANTENNA

Cyril M. Kaloi, Thousand Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 24, 1975, Ser. No. 571,153
Int. Cl.² H01Q 1/38, 9/28
U.S. Cl. 343—795 **12 Claims**



1. A notch fed electric microstrip dipole antenna having low physical profile and conformal arraying capability, comprising:

a. a thin ground plane conductor;

b. a thin rectangular radiation element having a notch extending into said element from one end thereof along the centerline of the element length, said element being spaced from said ground plane;

c. said radiating element being electrically separated from said ground plane by a dielectric substrate;

d. said radiating element having an optimum feed point located along the centerline of the length thereof at the inner end of said notch;

e. said radiating element being fed from a coaxial-to-microstrip adapter, the center pin of said adapter extending through said ground plane and dielectric substrate to the plane of said radiating element;

f. the length of said radiating element determining the resonant frequency of said antenna;

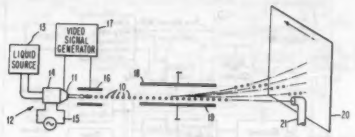
g. the antenna input impedance being variable to match most practical impedances as said feed point is moved along said centerline without affecting the antenna radiation pattern;

h. the antenna bandwidth being variable with the width of the radiating element and the spacing between said radiating element and said ground plane, the width of said notch being a factor as to the effective width of said element, said spacing between the radiating element and the ground plane having somewhat greater effect on the bandwidth than the element width.

3,947,851
DROP CHARGING METHOD FOR LIQUID DROP RECORDING

Winston H. Chen, San Jose, Calif., and Ho C. Lee, Owego, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 27, 1974, Ser. No. 483,503
Int. Cl.² G01D 15/18
U.S. Cl. 346—1 **4 Claims**



1. A method of recording with a jet of marking fluid on a recording surface comprising the steps of:

generating a stream of drops of marking fluid of substantially uniform size and spacing directed toward a nonrecording location;

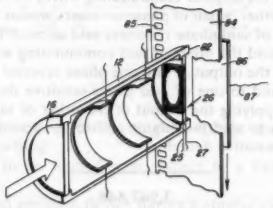
inducing electrical charges in selected pluralities of successive drops for deposit on said recording surface with each drop in a selected plurality having the same charge as each other drop in said plurality and successive selected pluralities having different induced charge values thereon; and

subjecting all said drops to an electrostatic field to deflect said drops in each selected plurality along substantially the same trajectory toward said surface according to the said induced charge thereon whereby the range of density of marking fluid on said recording surface is attained by varying the number of said successively and similarly charged drops impacting each predetermined recording area.

3,947,852
ELECTRON IMAGE RECORDER WITH SEMICONDUCTIVE IMAGE INTENSIFIER

Charles M. Redman, Las Cruces, N. Mex., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 25, 1974, Ser. No. 491,908
Int. Cl.² H01J 31/50, 31/58; G11B 7/02
U.S. Cl. 346—74 EB **2 Claims**



1. An electron image recorder comprising:

means for converting an input image to an electron image;

means positioned in the path of the electron image for storing and integrating the image during a first time interval, and transferring an intensified electron image therefrom during a second time interval; and

means, positioned in a path receiving the transferred electron image, for supporting electron sensitive film;

further, the integratng and storing means comprising:

first and second spaced conducting grids;

P and N semiconductor caps positioned in aligned spaced relationship to each other, the N caps located in a first plane while the P caps are located in a second plane, the P and N semiconductor caps further being positioned inwardly of the conducting grids and insulated from the conducting grids;

conductor means located inwardly of the conducting grids and connected between the P and N semiconductor caps;

P and N semiconductor biasing means connected between the conductor grid and respectively adjacent N and P semiconductor caps creating respective PN junctions therebetween for storing electrons therein during the first time interval; and

means connected to the conductor grids for biasing the grids and causing emission of stored electrons into space during the second time interval.

3,947,853

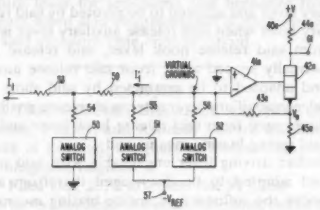
SUBSCRIPTING, SUPERSCRIPTING, AND CHARACTER HEIGHT COMPRESSION IN INK JET PRINTING APPARATUS

Clifford M. Denny; Hugh E. Naylor, III, and Thomas H. Williams, all of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 297,115, Oct. 12, 1972, abandoned. This application Dec. 20, 1973, Ser. No. 426,764

Int. Cl.² G01D *15/18*

U.S. Cl. 346—75 **12 Claims**



1. An ink jet printing apparatus for characters along a common base line and of normal height, superscript characters, subscript characters, and compressed characters, on a record medium, and wherein during printing of normal characters, successive drops are separated by a predetermined inter-drop spacing at said record medium established by predetermined inter-drop charge increments, comprising:

means for forming and propelling a stream of ink drops toward said record medium;

charging means operable to variably charge said drops in said stream, and constant deflection means for deflecting said drops in accordance with the charge on said drops in order to form on said record medium at least a line of characters having a normal height range, said characters normally being printed so that they are positioned along a normal common base line and said characters generally extending above said common base line, but some of said characters also normally subtending below said base line each of said characters comprising a series of vertical columns of drops serving to form said characters within a predetermined normal character height range;

driving means for applying a predetermined range of potentials to said charging means in order to deflect drops in said stream from a lower extremity of said normal character height range to an upper extremity of said normal character height range;

supplementary potential means for superimposing a supplementary deflection potential to said charging means in order to establish a different character base line level and thereby print certain characters along a base line that differs from said normal character base line;

compression means interconnected with said supplementary potential means to establish a smaller inter-drop spacing between successive drops directed to said record medium by reducing said inter-drop charge increments whereby each vertical column of drops occupies a shorter range of character height, thereby achieving compression of characters during printing.

3,947,854

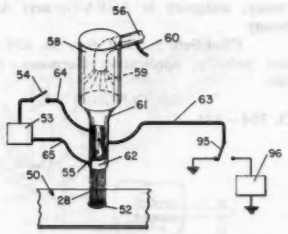
THERMAL PRINTER SYSTEMS

Raymond J. Hansen, Centerville; Gerald A. St. Jacques, Germantown, and Robert M. Whitely, Dayton, all of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Sept. 16, 1974, Ser. No. 506,067

Int. Cl.² G01D *15/10*

U.S. Cl. 346—76 R **7 Claims**



1. A thermal printer for printing on thermally sensitive material comprising in combination:

means for ionizing a gas to cause said gas to flow in a path directed to impinge on said material;

electrode means positioned in the flow path of said ionized gas for controlling the flow of said ionized gas;

a first potential source having a polarity and magnitude sufficient to repel said ionized gas;

a second potential source having a polarity and magnitude sufficient to de-ionize said ionized gas; and

switch means for selectively connecting said electrode means to either said first or said second potential source; and

heating means for heating said gas.

3,947,855

ELECTRIC SHUTTER MEANS WITH BATTERY CHECKING CIRCUIT

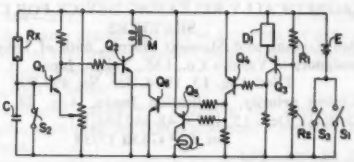
Nobuyoshi Inoue, Kawagoe, and Kenta Namioka, Tokyo, both of Japan, assignors to Copal Company Limited, Tokyo, Japan

Filed May 6, 1975, Ser. No. 574,942

Claims priority, application Japan, May 10, 1974, 49-52806

Int. Cl.² G03B *7/08*

U.S. Cl. 354—50 **3 Claims**



1. An electric shutter means comprising an exposure time control circuit including an electromagnet for controlling the

movement of closing shutter blades, a voltage checking circuit connected to said exposure time control circuit, a power source battery connected to said exposure time control circuit and voltage checking circuit, a power source switch connected between power source battery and said circuits and capable of simultaneously bringing said exposure time control circuit and voltage checking circuit into an operating condition, and interrupting means responsive to a checking signal issued from said voltage checking circuit when the voltage of said power source battery has dropped to be below a predetermined level for forcibly interrupting the passage of electricity to said electromagnet.

3,947,856

EQUIPMENT FOR CONTROLLING THE SUPPLY OF FRESH LIQUID IN LIQUID TREATMENT OF PHOTOGRAPHIC EMULSION CARRIERS

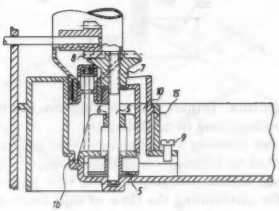
Emile Frans Stievenart, Hoboken, Antwerp, Belgium; Jürgen Müller, Munich, and Werner Stahl, Unterhaching, both of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Germany

Filed Feb. 5, 1974, Ser. No. 439,760

Claims priority, application Germany, Feb. 17, 1973, 2307986

Int. Cl.² G03D *3/02*

U.S. Cl. 354—324 **15 Claims**



1. In equipment for liquid treatment of photographic emulsion carriers, said equipment having a bath container for holding liquid for treating said emulsion carriers, said bath container having an overflow for limiting the maximum liquid level therein, an arrangement for adding fresh liquid to said bath container, comprising, in combination, scan means for sensing said emulsion carrier when in said bath container and furnishing a control signal when the quantity of so-sensed emulsion carrier has reached a predetermined quantity; removing means coupled to said scan means for forceably removing a determined quantity of liquid corresponding to said quantity of so-sensed emulsion carrier from said bath container in response to said control signal; and refill means operatively associated with said bath container for adding a quantity of fresh liquid corresponding to the so-removed quantity to said bath container.

3,947,857

MAGNETICALLY RELEASING DEVICE FOR CAMERA SHUTTERS

Hideo Kiyoshi, and Masaaki Morota, both of Tokyo, Japan, assignors to Yashica Co., Ltd., Tokyo, Japan

Filed Aug. 13, 1974, Ser. No. 497,099

Claims priority, application Japan, Aug. 24, 1973, 48-99248[U]; Dec. 15, 1973, 48-142344[U]

Int. Cl.² G03B *17/38*

U.S. Cl. 354—234 **4 Claims**

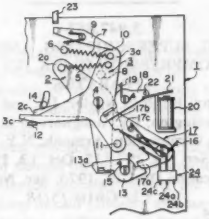
1. A magnetic shutter release mechanism for cameras comprising:

an electromagnet adapted to be excited by means of a release signal;

a release hook lever operatively associated with said electromagnet and adapted to be pivoted when said electromagnet is excited;

a release auxiliary lever having a portion engageable with said release hook lever and adapted to be disengaged from said release hook lever and pivoted under the influence of spring biasing means when said release hook lever is pivoted upon excitation of said electromagnet.

said release auxiliary lever being substantially L-shaped and including a long leg and a short leg, said long leg including said portion engageable with said release hook lever, and said spring biasing means being disposed upon said release auxiliary lever substantially at the junction of said long leg and said short leg so as to be positioned at a location remote from said portion of said release auxiliary lever engaged with said release hook lever;



a release lever operatively associated with said release auxiliary lever and adapted to be pivoted by said release auxiliary lever when said release auxiliary lever is disengaged from said release hook lever, said release lever being normally spaced apart from said release auxiliary lever and adapted to be contacted by said short leg of said release auxiliary lever after said release auxiliary lever is disengaged from said release hook lever and pivoted by said spring-biasing means; and

a shutter driving lever engageable with said release lever and adapted to be disengaged therefrom and pivoted under the influence of spring biasing means when said release lever is pivoted by said release auxiliary lever and also engageable with a mirror of said shutter mechanism whereupon being pivoted by said spring biasing means, said shutter driving lever actuates said mirror and releases said shutter mechanism.

3,947,858

ELECTROMAGNETIC CONTROL DEVICE FOR ELECTRONIC SHUTTER

Hiroaki Ishida, Yotsukaido, Japan, assignor to Seiko Koki Kabushiki Kaisha, Japan

Filed Oct. 10, 1974, Ser. No. 513,855

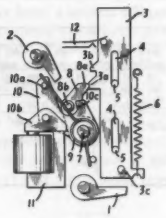
Claims priority, application Japan, Oct. 11, 1973, 48-118208[U]

Int. Cl.² G03B *9/08, 17/38*

U.S. Cl. 354—234 **4 Claims**

1. In an electronic camera shutter, an electromagnet for closing the shutter upon termination of the exposure time and de-energization thereof, an exposure time control circuit for energizing the electromagnet and the de-energizing thereof upon termination of the exposure time determined by said exposure time control circuit, a movable release lever cooperative with said exposure control circuit actuatable for initiating energization of said electromagnet and initiating opening of the shutter for taking an exposure, means biasing said release lever to a rest position, an electromagnet armature engagable with said electromagnet, an armature lever pivotally mounted supporting said armature, a holding lever engagable with said armature lever and cooperative with said release lever in said rest position to preclude said armature lever from separating said electromagnet armature from said

electromagnet, a single spring intermediate the holding lever and the armature lever and coactive therewith constantly biasing the holding lever in a direction for engaging with said armature lever and driving it in a direction for separating said armature from said electromagnet for initiating closing of the shutter by actuation of said armature lever in said direction, said release lever having a part bearing on said holding lever holding said holding lever against the biasing of said spring while in the rest position of said release lever, a part of said holding lever biasing the spring in a direction for biasing the



armature lever in a direction for applying said armature to said electromagnet when said release lever is in said rest position means for closing the exposure time control circuit when the release lever is actuated, whereby upon actuation of said release lever said exposure time control circuit is energized and the electromagnet is energized to retain said armature attracted thereto and said holding lever is released for driving said armature lever for separating said armature from said electromagnet when said electromagnet is deenergized unde control of said exposure time control circuit.

3,947,859

ELECTRIC CIRCUIT-BREAKER APPARATUS

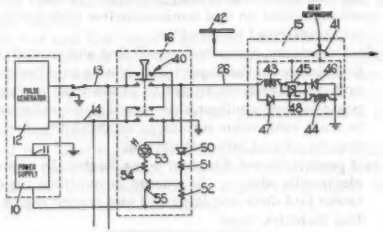
John Menmuir, Pudsey, and Kenneth Milford Faulkes, Horsforth, both of England, assignors to Lucas Aerospace Limited, Birmingham, England

Filed Oct. 23, 1974, Ser. No. 517,260

Claims priority, application United Kingdom, Oct. 27, 1973, 50099/73

Int. Cl.² G08B *21/00*

U.S. Cl. 340—253 B **15 Claims**



1. A remotely-controllable circuit breaker apparatus comprising means responsive to an input signal for generating a single electrical control pulse of known duration and current, a conductor along which said control pulse can pass, switch means for selecting the polarity of said pulse applied to said conductor, said switch means including means, responsive to each operation of said switch means, for applying said input signal to said pulse-generating means, a circuit breaker device including a first contact element movable to an open circuit position in response to the heating effect of a current therethrough, a second contact element movable in unison with said first element and being respectively open and closed in closed and openn positions of said first element, and an electro-magnetic actuator means responsive to pulses of respective opposite polarities in said conductor for setting said first contact element in respective open and closed positions, said second contact element being operable, when in one of its operating positions and in the absence of a control pulse, to apply a voltage signal to said conductor, said circuit breaker apparatus further including an indicator device connected to said conductor and responsive to said voltage signal.

3,947,860

REMOTE FOCUSING DEVICE FOR CAMERAS

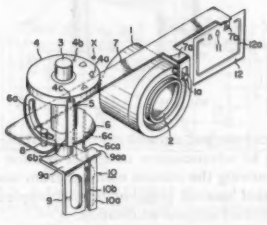
Tadayuki Imai, Kawasaki, and Toshitaka Shiratori, Sohka, both of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 419,524, Nov. 28, 1973, abandoned. This application Sept. 16, 1974, Ser. No. 505,969

Claims priority, application Japan, Dec. 4, 1972, 47-138475

Int. Cl.² G03B *3/00*

U.S. Cl. 354—195 **7 Claims**



1. A remote focusing device for a camera comprising:

a. means rotatable for moving a camera lens in the direction of the optical axis thereof for focusing,

b. a connecting member slidably disposed for rotating said camera lens moving means,

c. a focusing ring rotatably and coaxially disposed around a shutter release button and provided with focusing marks marked around the periphery of its top surface,

d. a cam plate provided with a focusing cam and coupled so as to be rotatable in unison with said focusing ring,

e. a cam follower in engagement with said focusing cam of said cam plate and drivingly coupled to said connecting member so as to slide the same in accordance with the movement of said focusing ring, and

f. a focus index mark marked upon a camera body in association with said focusing marks.

3,947,861

FILM FRAME COUNTING DEVICES FOR STILL CAMERAS

Shuji Kimura, and Kouichi Daitoku, both of Tokyo, Japan, assignors to Nippon Kogaku, Tokyo, Japan

Filed July 22, 1974, Ser. No. 490,335

Claims priority, application Japan, July 23, 1973, 48-82999

Int. Cl.² G03B *17/36*

U.S. Cl. 354—217 **12 Claims**

1. A film frame counting device in a camera for indicating the number of film frames exposed during regular photography, the device comprising:

a numerical counter;

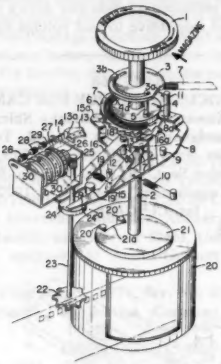
count-changing means for changing the count in the counter each time the film is advanced a predetermined amount;

a release member movable between a first position for preventing changing of the count in said counter and a second position for permitting changing of the count;

a cam; and

means for rotating the cam in response to advancement of film in said camera;

the cam having means cooperable with the release member for holding the release member in said first position dur-



ing a predetermined amount of rotation of the cam corresponding to advancement of leader portion of the film and for moving the release member from said first position to said second position upon completion of said predetermined amount of rotation.

3,947,862

EXPOSURE MULTIPLICATION INDICATING MEANS FOR AUTOMATIC EXPOSURE SETTING CAMERA

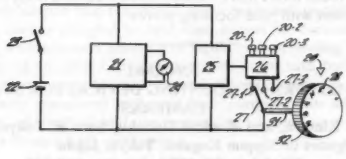
Koichiro Watanabe, Funabashi, and Tetsuji Shono, Ranzan, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 397,938, Sept. 17, 1973, abandoned. This application Jan. 30, 1975, Ser. No. 545,508

Claims priority, application Japan, Sept. 21, 1972, 47-94929

Int. Cl.² G03B 17/00, 7/00

U.S. Cl. 354—289 **6 Claims**



1. In a camera the inventive combination comprising:

an automatic exposure setting means;

means for indicating the exposure setting determined by said exposure setting means;

means for multiplying the exposure setting so as to set the exposure at some value other than that automatically determined;

means for indicating the multiplication of said exposure setting by said exposure multiplying means; and

means connecting the exposure multiplying means and the multiplication indicating means so that the multiplication indicating means automatically indicates the multiplication as the multiplying means is set.

3,947,863

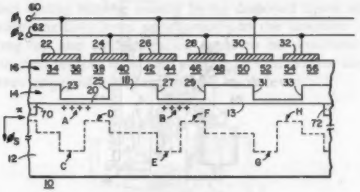
CHARGE COUPLED DEVICE WITH ELECTRICALLY SETTABLE SHIFT DIRECTION

Michael W. Powell, Mesa, Ariz., assignor to Motorola Inc., Chicago, Ill.

Continuation of Ser. No. 375,254, June 29, 1973, abandoned. This application June 18, 1975, Ser. No. 587,929

Int. Cl.² H01L 29/78

U.S. Cl. 357—24 **7 Claims**



1. A monolithic charge coupled device for storing and sequentially transferring information in a predetermined direction comprising:

a semiconductor body having a major surface;

a first dielectric layer on said major surface, said first dielectric layer including a plurality of first regions of a first thickness and a plurality of second regions of a second thickness, said second thickness being substantially less in magnitude than said first thickness, said first and second regions being alternately positioned along said major surface;

a second dielectric layer on said first dielectric layer;

a plurality of spaced first conductive electrodes on said second dielectric layer;

a plurality of spaced second conductive electrodes on said second dielectric layer, said first and second conductive electrodes being, respectively, alternately positioned on said second dielectric layer, each of said first and second conductive electrodes disposed above a portion of one of said first regions and one of said second regions, said portion including the boundary of the regions and adjacent edges of said first and second electrodes overlying like thicknesses of said first dielectric layer;

input means on said semiconductive body for transferring information into said charge coupled device;

receiving means on said semiconductive body for receiving said transferred information;

clocking means connected to said first and second conductive electrodes for sequentially biasing said first and second conductive electrodes to produce an asymmetrical potential well configuration in said semiconductive body beneath said major surface to establish the direction of transfer of said information; and

said predetermined direction being electrically alterable by electrically altering the charge at interface regions between said dielectric layer and said second region of said first dielectric layer.

3,947,864

DIODE-INTEGRATED THYRISTOR

Tsutomu Yatsuo; Tatsuya Kamei, and Koichi Wajima, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 5, 1974, Ser. No. 439,717

Claims priority, application Japan, Feb. 12, 1973, 48-16595

Int. Cl.² H01L 29/747

U.S. Cl. 357—39 **18 Claims**

1. A diode-integrated thyristor device comprising:

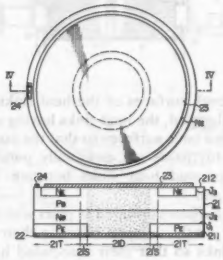
i. a semiconductor body having two opposing principle surfaces and four layers of alternate conductivity type including

a. a first inner layer of a first conductivity type, having a portion exposed to one of said principal surfaces,

b. a second inner layer of a second conductivity type opposite said first conductivity type, having a portion exposed to the other principal surface and adjoining said portion of said first inner layer, thereby forming a first PN junction which laterally extends throughout said semiconductor body, said first inner layer being highly conductive relative to said second inner layer,

c. a first outer layer of said second conductivity type, formed in said first inner layer, thereby forming with said first inner layer a second PN junction the edge face of which is exposed to said one principal surface adjacent said portion of said first inner layer, and

d. a second outer layer of said first conductivity type, formed in said second inner layer at a position opposing to said first outer layer, thereby forming with said second inner layer a third PN junction the edge face of which is exposed to said other principal surface, whereby a four layer region is defined by said four adjacent layers and a two layer region juxtaposed with



said four layer region is defined by said portions of said two inner layer;

ii. a first electrode in ohmic contact with the surfaces of said portion of said first inner layer and said first outer layer, at said one principal surface;

iii. a second electrode in ohmic contact with the surfaces of said portion of said second inner layer and said second outer layer, at said other principal surface; and

iv. control electrode means for triggering said device, in contact with the surface of one of said four layers, apart from both said first and second electrodes and said two layer region,

wherein said four layer region and said first and second electrodes and said control electrode means define a thyristor which conducts current in a first direction,

said two layer region and said first and second electrodes define a diode rectifier which conducts current in a second direction, and

said two layer region has recombination centers distributed therethroughout, the concentration of recombination centers in said two layer region being higher than that in said four layer region.

3,947,865

COLLECTOR-UP SEMICONDUCTOR CIRCUIT STRUCTURE FOR BINARY LOGIC

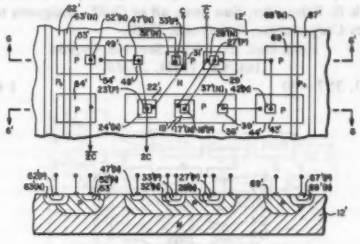
Lewis K. Russell, San Jose, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed Oct. 7, 1974, Ser. No. 512,919

Int. Cl.² H01L *27/02*; **H03K** *3/26, 19/34, 19/22*

U.S. Cl. 357—46 **6 Claims**

1. In a collector-up binary circuit structure of the type utilizing vertical active devices the structure comprising, a semiconductor body of one conductivity type having a planar surface, spaced first, second, third and fourth vertical transistors formed in said body including opposite conductivity base regions formed in said body extending to said surface, and one conductivity collector regions formed in the respective base regions extending to said surface, said body forming the emitter region for said transistors, fifth, sixth, seventh and eighth vertical transistors, and fifth and sixth transistors formed in the base region of said second transistor including spaced one conductivity regions formed in said base region and extending to said surface, said second transistor base region forming the collectors of said fifth and sixth transistors, said spaced one conductivity regions forming the respective base regions of said fifth and sixth transistors, and opposite conductivity regions formed in the respective base regions of said fifth and sixth transistors extending to said surface to form the emitter regions of said fifth and sixth transistors, said seventh and eighth transistors formed in the base region of said fourth transistor including spaced one conductivity regions formed in said base region and extending to said surface, said base region forming the collectors of said seventh and eighth transistors, said spaced one conductivity regions forming the base regions of said seventh and eighth transistors, and opposite conductivity regions formed in the respective base regions of



said seventh and eighth transistors and extending to said surface to form the emitter regions of said seventh and eighth transistors and interconnecting means for connecting said structure as a binary circuit having first and second voltage supply terminals, said interconnecting means including means for connecting the base regions of said fifth and seventh transistors to a binary input, connecting the base regions of said sixth and eighth transistors to the complement of said binary input, connecting the collector region of the said third transistor to the emitter regions of said sixth and eighth transistors, connecting the collector region of said fourth transistor to the base region of said third transistor, connecting the base regions of said first and third transistors and the collector regions of said fifth, sixth, seventh and eighth regions to the first terminal of a voltage supply and the semiconductor body to the second terminal of a voltage supply, connecting the collector of said seventh transistor, the collector of said second transistor and the base of said first transistor to the binary output terminal, connecting the collector of said fifth transistor and the collector of said first transistor to the binary complement output terminal, so that a binary circuit is provided.

3,947,866

ION IMPLANTED RESISTOR HAVING CONTROLLED TEMPERATURE COEFFICIENT AND METHOD

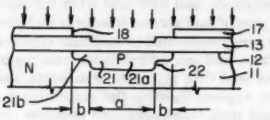
Hans H. Stellrecht, San Jose, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Continuation-in-part of Ser. No. 373,458, June 25, 1973, abandoned. This application May 31, 1974, Ser. No. 475,128

Int. Cl.² H01L *27/02*

U.S. Cl. 357—51 **7 Claims**

1. In a semiconductor structure having an ion implanted resistor formed therein with controlled temperature coefficient, a semiconductor body of one conductivity type and having a planar surface, a region of opposite conductivity type formed in the body by ion implantation and being defined by a PN junction extending to the surface and serving as a resis-

tor, one portion of said region in cross-section having a greater depth than the remaining portion of the region whereby there is provided a resistor having a resistance whose effective value

is given by the parallel resistance of said one portion and the remaining portion which has a controlled temperature coefficient.

3,947,867

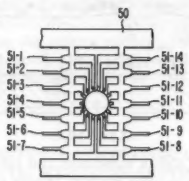
TWO PART PACKAGE FOR A SEMICONDUCTOR DIE

Edward F. Duffek; Ernest J. Funk, both of Cupertino; Alfred S. Jankowski, San Jose; Jack C. Lane, Saratoga; William L. Lehner, Los Altos Hills; Floyd F. Oliver, Los Altos, and Mark R. Schneider, San Jose, all of Calif., assignors to Signetics Corporation, Sunnyvale, Calif.

Filed Dec. 21, 1970, Ser. No. 99,904

Int. Cl.² H01L *23/48*

U.S. Cl. 357—70 **1 Claim**



1. A semiconductor device which comprises:

a semiconductor die containing on one face thereof a plurality of solder bumps;

a corresponding plurality of electrically-conducting first leads attached to and held on the face of said die by said solder bumps, each lead containing a selectively shaped bend therein in a portion of the lead beyond the solder bump, said bend relieving thermal stresses induced in said lead;

first packaging material surrounding said semiconductor die and said leads to beyond said bends thereby providing a package for said semiconductor die from which protrude selected portions of said first leads;

a second group of leads attached on a one-to-one basis to said selected portions of said first leads protruding from said package, and

second packaging material surrounding and contacting on all exposed surfaces said first packaging material and covering all of the exposed surfaces of said first group of leads and portions of each lead in said second group.

3,947,868

AIR-COOLED CONVERTER ASSEMBLY, HAVING HEAT SINKS SHAPED AS ISOSCELES TRIANGLES

Herbert Nitsche, Spardorf, and Gunter Wittig, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Feb. 6, 1974, Ser. No. 440,047

Claims priority, application Germany, Feb. 15, 1973, 2307527

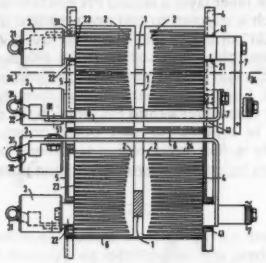
Int. Cl.² H01L *39/02*

U.S. Cl. 357—81 **10 Claims**

1. In an air-cooled converter assembly in which disc thyristors are clamped between electrically conductive heat sinks, an arrangement which saves space and permits ease of connection comprising:

a. a plurality of heat sinks each having a front surface, a back surface and a plurality of side surfaces, at least some of said heat sinks having front and back surfaces essentially in the shape of an isosceles triangle;

b. a plurality of disc thyristors each disc thyristor clamped between two heat sinks at least one of which has front and back surfaces in the shape of an isosceles triangle, said disc thyristors having their surfaces clamped in contact



with the back surfaces of the heat sinks between which they are clamped, the heat sinks having essentially parallel front and back surfaces so that the contact surfaces of said disc thyristors are essentially parallel to the front surfaces of said heat sinks between which they are clamped; and

c. said disc thyristors grouped in pairs with each pair of disc thyristors jointly clamped between their associated pairs of heat sinks so that their associated heat sinks having front and rear surfaces shaped as an isosceles triangle lie adjacent each other along their hypotenuses.

3,947,869

SEMICONDUCTOR DEVICE HAVING INTERNAL JUNCTION PASSSIVATING INSULATING LAYER

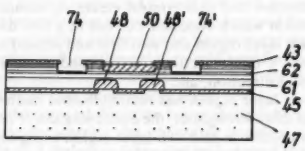
Hans-Jürgen Schütze, and Klaus Hennings, both of Ulm, Donau, Germany, assignors to Telefunken Patentverwertungsgesellschaft m.b.H., Ulm, Germany

Filed Dec. 14, 1965, Ser. No. 513,677

Claims priority, application Germany, Dec. 19, 1964, 27659

Int. Cl.² H01L *27/12*

U.S. Cl. 357—49 **3 Claims**



1. A transistor comprising in combination: a body of semiconductor material of a first conductivity type having opposed planar major surfaces; an emitter region of the opposite conductivity type disposed in said semiconductor body adjacent one of said major surfaces and forming an emitter-base pn-junction with said body which extends to said one major surface; a layer of insulating material disposed on the opposite surface of said semiconductor body and having an aperture opening therein beneath said emitter region and having approximately the same lateral dimensions as said emitter region; a diffused collector region of said opposite conductivity type disposed within said semiconductor body adjacent said opposite surface and forming a collector-base pn-junction with said body which extends to said opposite major surface

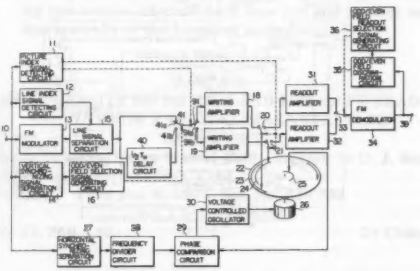
adjacent the edges of said aperture opening and beneath said insulating layer; a substrate member of low resistivity conductive material of said opposite conductivity type deposited upon said layer of insulating material and making ohmic contact to said collector region via said aperture opening at least one channel formed in said one major surface in said semiconductor body adjacent the emitting edge of said emitter-base pn-junction; and a conductive layer disposed at the bottom of said channel and ohmically contacting said semiconductor body to form a base electrode for said transistor.

3,947,870

RECEIVING SYSTEM FOR AUXILIARY INFORMATION SIGNAL TRANSMITTED DURING THE VERTICAL BLANKING PERIOD OF A TELEVISION SIGNAL

Yasufumi Yumde; Hiroaki Nabeyama, both of Yokohama, and Michio Masuda, Tokyo, all of Japan, assignors to Hitachi, Ltd., Japan

Filed July 22, 1974, Ser. No. 490,282
Claims priority, application Japan, July 24, 1973, 48-83459
Int. Cl.² H04N 9/00, 7/08
U.S. Cl. 358—4 **7 Claims**



1. In a system for receiving a first television signal divided into a plurality of line signals each thereof corresponding to a horizontal scanning period and transmitted in such a manner that at least one of said line signals is inserted in a second television signal during each vertical blanking period thereof, the combination comprising: means for detecting said vertical blanking periods and generating an odd/even field selection signal; means for separating said line signals of said first television signal from said second television signal; memory means comprising a rotary recording medium having an odd field television signal recording track and an even field television signal recording track; means responsive to said odd/even field selection signal for storing said separated line signals of the odd field on said odd field signal recording track of said memory means and said separated line signals of the even field on said even field signal recording track of said memory means; and means for controlling the speed of revolutions of said memory means to rotate said memory means at a predetermined speed of revolutions whereby said line signals are recorded on the tracks of said memory means in regular sequency and without leaving spaces between said line signals.

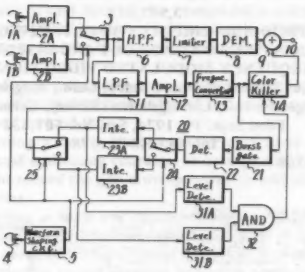
2. A receiving system according to claim **1**, wherein said first television signal consists of an NTSC color television signal, and the line signals of odd field are inserted in said second television signal during the vertical blanking period of one of alternating fields thereof and the line signals of even field are inserted in said second television signal during the vertical blanking period of the other of the alternating fields thereof, further comprising: means for reading out stored signals from said memory means repeatedly and continuously; means for dividing each of video signals read out from said memory means into a luminance signal and a chrominance signal; means for splitting the phase of said chrominance signal by 0° and 180°, respectively; means for separating the vertical synchronizing signals from said video signals read out from said memory means and generating an odd/even field selection signal; selector means responsive to said selection signal for alternately selecting one or the other of said phase-splitted chrominance signals in accordance with the classification of odd and even fields; and means whereby said odd field chrominance signals and said even field chrominance signals are respectively added to said luminance signal to generate video signals having a restored chrominance subcarrier phase.

3,947,871

COLOR VIDEO SIGNAL REPRODUCING APPARATUS

Shinji Amari, Houya, and Kazuo Yamagiwa, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 5, 1974, Ser. No. 521,203
Claims priority, application Japan, Nov. 16, 1973, 48-128885
Int. Cl.² H04N 5/795, 9/49
U.S. Cl. 358—8 **8 Claims**



1. A color video signal reproducing apparatus comprising

a plurality of rotary heads operative in a cyclically repeated order to successively reproduce recorded color video signals containing luminance and chrominance components;

an output terminal;

circuit means for transmitting the successively reproduced signals from said rotary heads to said output terminal and including variable gain means operative on at least said chrominance component of the reproduced signals, and color killer means operative to eliminate said chrominance component from the reproduced signals as received at said output terminal

gain control means including a plurality of control signal elements respectively corresponding to said plurality of rotary heads and each being operative to apply a respective gain control signal to said variable gain means during reproducing of the recorded color video signals by the respective one of said rotary heads; and

color killer control means for effecting continuous operation of said color killer means so long as the level of the reproduced signals from any of said rotary heads is below a predetermined level.

3,947,872

PROCESS FOR THERMOREMANENT DUPLICATION OF MAGNETIC RECORDING MASTER TAPE ONTO SLAVE TAPE WITH REDUCED DIMENSIONAL CHANGES OF SLAVE TAPE

Takeo Asai, Sagamihara, Japan, assignor to Teijin Ltd., Osaka, Japan

Filed Nov. 21, 1974, Ser. No. 525,746

Claims priority, application Japan, Nov. 27, 1973, 48-132537

Int. Cl.² G11B *5/86*

U.S. Cl. 360—16 **10 Claims**

1. A process for thermoremanent duplication of magnetic signals of a magnetic recording master tape on a magnetic recording slave tape consisting of a polyester film base and a layer of a ferromagnetic material coated thereon, which comprises the following steps of

i. heating said slave tape above the Curie point of said ferromagnetic material,

ii. contacting said master tape and said slave tape,

iii. cooling said slave tape below its Curie point while contacted with said master tape,

iv. separating said master tape and said slave tape, and then

v. heat-treating said slave tape without stretch at a temperature of at least 40°C. but less than the Curie point of said ferromagnetic material for at least 0.1 second.

3,947,873

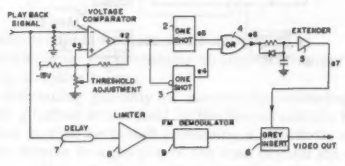
METHOD AND CIRCUIT FOR DETECTING AND COMPENSATING FOR DROP-OUT AND DISTORTION OF FREQUENCY MODULATED VIDEO SIGNALS

William A. Buchan, Newport Beach, Calif., assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Sept. 19, 1974, Ser. No. 507,432

Int. Cl.² H04N *5/78*

U.S. Cl. 360—38 **4 Claims**



1. A circuit, primarily for use with magnetic media video playback apparatus, to detect both signal drop-out and distortion in a frequency modulated signal, said circuit comprising:

a sensing means to detect and indicate when the voltage level of said frequency modulated signal passes from positive to negative and attains a threshold negative level and also to detect and indicate when the voltage level of said playback signal passes from negative to positive and attains a threshold positive level, said positive and negative threshold level being of substantially the same magnitude;

a timing means to indicate when the time period between said indications of threshold voltage level attainments exceeds a predetermined length;

a demodulator to demodulate said frequency modulated signal; and

a signal replacement means to generate a fill-in signal to replace that portion of the demodulated signal corresponding to the portion of the frequency modulated signal which resulted in the indication of excessive time lapse between said zero crossings and threshold level attainments;

said sensing means comprising a dual output high speed positive feedback voltage comparator and said timing means comprising a logic gate having at least two inputs and one output, the inputs of said logic gate being coupled to the outputs of said voltage comparator in such a manner to provide short duration signals each time the respective outputs go positive and the output of which is connected to a retriggerable pulse generator whereby a signal of said predetermined length from said pulse generator to activate said signal replacement means is produced only when the time period between zero crossings and threshold level attainments exceeds said predetermined time.

3,947,874

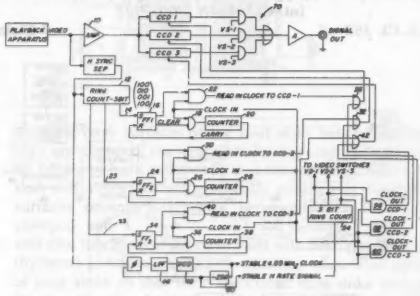
APPARATUS FOR MODIFYING THE TIME BASE OF SIGNALS

Robert A. Lentz, Del Mar, Calif., assignor to Eastman Technology, Inc., Rochester, N.Y.

Filed Oct. 29, 1974, Ser. No. 519,359

Int. Cl.² H04N *5/795*

U.S. Cl. 360—36 **2 Claims**



1. Apparatus for removing flutter from video signals having a nominal periodicity, said apparatus comprising:

a. a plurality of analog shift registers;

b. means for successively clocking video signals into said analog shift registers at a rate sufficient to load an analog shift register fully with samples of a video signal that has a predetermined normal duration within the duration of said signal;

c. means for clocking video signals out of said analog shift registers, said clock-out rate being the same as said clock-in rate; and

d. logic means cooperative with said analog shift registers for enabling samples of one video signal to be clocked into one analog shift register and for simultaneously enabling signal samples of a previously occurring video signal which are stored within another analog shift register to be clocked out of said other analog shift register.

3,947,875

MAGNETIC RECORDER TEST ARTICLE AND METHODS

Frederick W. Bull; Richard A. Leavitt, and Robert L. Weiss, all of Longmont, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 6, 1974, Ser. No. 495,164

Int. Cl.² G11B *5/09*

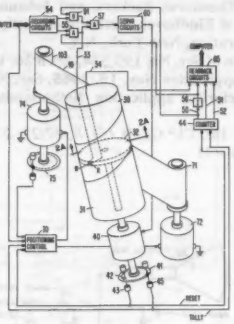
U.S. Cl. 360—39 **36 Claims**

1. A test tape for helical scan recorder having an elongate flexible substrate with a magnetic layer for receiving signals, a plurality of recorded helical scan test sections spaced along said tape and said test sections having recorded signals for inducing errors, each said section including helical scan type record tracks,

the improvement including in combination:

a first type of said test sections having recorded signals exhibiting measurable head-to-helical track error-induc-

ing characteristics at least one of which relates to a given head-to-tape error inducting condition, and

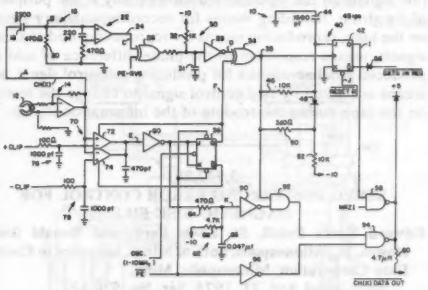


a plurality of said first type test sections in said type including one section adjacent each tape end and another section centrally of the length of said tape.

3,947,876
DUAL DENSITY 800 bpi NRZI AND 1600 bpi PE READ CIRCUIT FOR A DIGITAL MAGNETIC TAPE TRANSPORT

Martin D. Gray, Sierra Madre, Calif., assignor to C. J. Kennedy Company, Altadena, Calif.

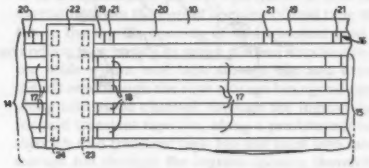
Filed Jan. 6, 1975, Ser. No. 538,532
Int. Cl.² G11B 5/09
U.S. Cl. 360—40 **21 Claims**



1. A read circuit for a digital tape transport comprising:
a differentiator connected to receive a read head signal and generate a differentiated read head signal as an output;
an integrator circuit which is biased toward a predetermined no signal condition, the integrator circuit being connected to integrate the differentiated read head signal and generate an integrated differentiated read head signal as an output;
a latch connected to generate a latched first output signal when a transition occurs in the differentiated output signal while the integrated differentiated read head signal exceeds a selected threshold magnitude with respect to the no signal condition;
a gating circuit coupled to pass the differentiated read head signal as a second output signal when enabled; and
an envelope detector coupled to enable the gating circuit when the time between successive read head pulses of predetermined minimum magnitudes does not exceed a selected minimum time.

3,947,877
METHOD AND DEVICE FOR TIMING THE DATA READING AND THE RECORDING OPERATIONS ON A MAGNETIC TAPE

Vittore Vittorelli, Ivrea (Turin), Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Continuation of Ser. No. 378,355, July 11, 1973. This application Oct. 31, 1974, Ser. No. 519,704
Claims priority, application Italy, July 17, 1972, 69310/72
Int. Cl.² G11B 5/09
U.S. Cl. 360—48 **6 Claims**

1. A method for timing the data recording and reading operation in a recording-reading device using a magnetic tape having a plurality of parallel tracks for storing data in blocks of characters separated by constant gaps and a track for storing addresses of said data blocks, comprising a reading head and a recording head preceding said reading head with respect to the movement of the tape, the method comprising the steps of:
— recording in said addressing blocks an addressing character identifying the blocks aligned therewith transversely disposed on said tape,
— recording a first service character at a fixed distance from said addressing character to arrange said recording head to record the gap corresponding to said addressing character,
— recording at least one erasing character following said first service character for defining a period proportional to the speed of the tape during which said recording head is enabled to record said gap according to the length of said erasing character on said magnetic tape, and
— recording a second service character following said erasing character for enabling said recording head to record said data on the block corresponding to said address, whereby the interval before the start of the recording of data in a block is proportional to the speed of the tape.

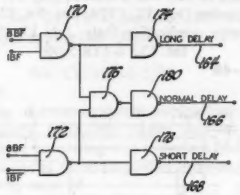
3,947,878
SELF-CLOCKING NRZ RECORDING AND REPRODUCTION SYSTEM

Ronald P. McGrath, Livonia, and William A. Bieher, Detroit, both of Mich., assignors to General Instrument Corporation, New York, N.Y.

Division of Ser. No. 235,583, March 17, 1972, Pat. No. 3,852,810. This application Aug. 9, 1974, Ser. No. 495,994
Int. Cl.² G11B 5/09
U.S. Cl. 360—51 **14 Claims**

1. In a data storage system of the type wherein data is stored in a bulk medium according to a binary code in which opposite bit values are represented in bit cells by respective levels and wherein the sync transition occurs every n data bit cells: a readout system comprising clock means responsive to the occurrence of a sync transition for generating a sequence of timing signals representing the position in time of successive data cells being read, means for reading the bit values in the successive bit cells, means for counting the successive bit cells to identify each occurrence of *n* data bit cells, and compensation means responsive to particular patterns of the level transitions associated with the data cells preceding and following each identified sync transition of *n* data bit cells for adjusting the time relationship between the sync transition and said

sequence of reading the bit values in the successive bit cells in accordance with such particular patterns to compensate for



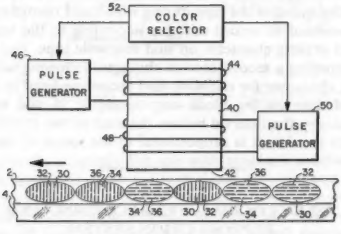
shifting of said sync transition as read from said medium by said readout system.

3,947,879

MULTI-COLOR RECORDING MEDIUM RESPONSIVE TO FORCE FIELDS AND APPARATUS FOR RECORDING ON THE MEDIUM

Norman L. Stauffer, Englewood, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 4, 1974, Ser. No. 529,575
Int. Cl.[2] G11B *11/10, 5/62*
U.S. Cl. 360—56 **10 Claims**



6. A recorder for recording on a web member having a first and a second force field responsive means therein and including highly reflective and flake-like particles suspended within said web member in said first and second means, said first and second means responding to first and second force fields respectively to produce a reorientation of said particles from a first position to a second position and said particles within said first means having a response characteristic to incident electromagnetic energy different from a response characteristic of particles in said second means comprising

means for generating said first force field in said first and second means,

means for generating said second force field in said first and second means, and

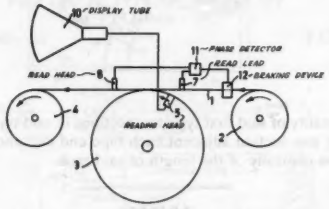
means for selectively energizing said last two-mentioned means.

3,947,880

MAGNETIC RECORDING AND REPRODUCING APPARATUS WITH TAPE TENSION CONTROL

Franciscus Theodorus Backers, and Johannes Hendrik Wessels, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 190,314, April 26, 1962, abandoned.
This application Nov. 15, 1965, Ser. No. 507,745
Claims priority, application Netherlands, May 2, 1961, 264297
Int. Cl.[2] G11B *15/18, 27/22, 27/28*
U.S. Cl. 360—71 **11 Claims**



1. A system for compensating for elongation or shrinkage of a magnetic tape occurring after information signals have been recorded on the tape, comprising: a magnetic tape wound helically on a drum and adapted to co-act with a recording/reproducing magnetic head for recording/reproducing information signals on the tape located substantially at the periphery of the drum, recording means for recording auxiliary signals on the tape, reproducing means for reproducing said auxiliary signals, means responsive to the phase difference of said reproduced auxiliary signals for producing a control signal, and means energized by said control signal to change the tension on the tape during the reading of the information signals.

3,947,881

SERVO POSITIONING ERROR CONTROL FOR MAGNETIC DISK FILE

Edward Kevin Dahill, St. Louis Park, and Ronald Bruce Howes, Jr., Minneapolis, both of Minn., assignors to Control Data Corporation, Minneapolis, Minn.

Filed Apr. 21, 1975, Ser. No. 570,522
Int. Cl.[2] G11B *5/58, 21/08, 19/14*
U.S. Cl. 360—78 **6 Claims**

1. In a magnetic disk memory storage system comprising a head assembly for use with a disk pack having at least one record disk and a servo track disk, an actuator assembly for said head assembly, and means for developing a head position error signal from signals received from said head assembly, the improvement comprising a servo error control for developing signals to control said actuator from signals received from said means for developing a head position error signal:

means for receiving head position error signals from said means for developing a head position error signal,

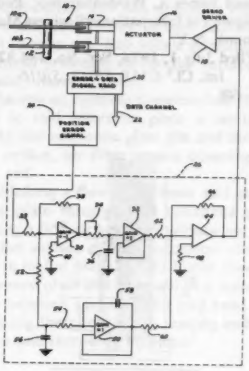
means, connected with said means for receiving, for providing a low pass filter signal as an output signal,

means, connected with said means for receiving, for inverting said head position error signals to produce an inverted head position error signal,

means, connected with said means for inverting, for integrating said inverted head position error signal to produce a pseudo velocity signal, and

means, connected with said means for integrating and with

said means for providing a low pass filter signal, for summing said pseudo velocity signal and said low pass filter



signal in a predetermined proportion as an output signal adapted to control said actuator.

3,947,882

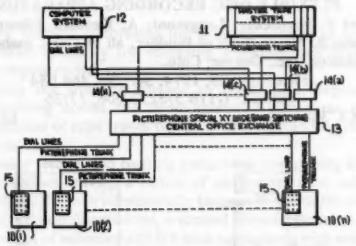
VENDING SYSTEM FOR REMOTELY ACCESSIBLE STORED INFORMATION

Robert W. Lightner, P.O. Box 42, Cocoa Beach, Fla. 32931

Division of Ser. No. 148,714, June 1, 1971, Pat. No. 3,718,906. This application Nov. 29, 1972, Ser. No. 310,565

Int. Cl.[2] G11B *15/68, 5/86, 23/04, 15/02*

U.S. Cl. 360—92 **5 Claims**



1. A central information distribution facility of the type in which information stored on plural individual endless tapes is selectively retrievable, said facility comprising:

a multiple cavity rack, each cavity adapted to receive a tape cartridge;

plural electrical connectors secured to said rack at each cavity location;

a drive capstan having a longitudinal axis lengthwise through all of said multiple cavities;

means for continuously rotating said drive capstan about its longitudinal axis;

multiple tape cartridges each comprising:

a housing arranged to fit in and be received by any of said multiple cavities, said housing comprising first and second spaced walls defining an interior region therebetween, said interior region having a thickness which is slightly larger than the width of said endless tapes, said housing being arranged to be received in a cavity with the housing thickness extending in the direction of the longitudinal axis of said drive capstan;

a relatively large tape storage bin defined within said interior region;

a relatively small transient tape bin defined within said interior region;

an ingress opening and an egress opening for said transient tape bin;

an ingress opening and an egress opening for said tape storage bin, said ingress opening for said tape storage bin being the same opening as the egress opening for said transient tape bin;

a guide channel defined about a portion of the peripheries of said tape storage bin and said transient tape bin and extending from the egress opening of said tape storage bin to the ingress opening of said transient tape bin;

an endless tape having its major portion disposed in multiple folds within said tape storage bin and extending therefrom through the tape storage bin egress opening, along said guide channel, through the ingress opening for said transient tape bin, along a predetermined path through said transient tape bin and back into said tape storage bin through the ingress opening therefor, said tape being disposed with its width extending in the direction of the thickness of said housing;

a recessed portion of said housing arranged to receive said drive capstan adjacent said predetermined path when said housing is received by a cavity;

wherein said predetermined path in said transient tape bin comprises a playback head, a plurality of tape guide means for maintaining said endless tape taut as it passes said playback head, and pinch roller means urged toward said predetermined path to co-operatively and continuously engage said endless tape in driving relationship with said drive capstan; and

connector means electrically connected to said playback head and arranged to mate with said plural electrical connectors at the cavity in which said housing is received.

3,947,883

INDICATOR DEVICE FOR SLOT-IN TYPE CASSETTE TAPE RECORDER

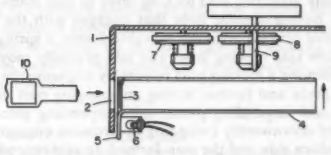
Shoji Suzuki, Iwaki, Japan, assignor to Alps Motorola, Inc., Tokyo, Japan

Filed Jan. 2, 1975, Ser. No. 538,094

Claims priority, application Japan, Feb. 20, 1974, 49-19722[U]

Int. Cl.[2] G11B *1/02, 23/04, 5/78*

U.S. Cl. 360—93 **6 Claims**



1. A cassette tape player including a tape drive mechanism comprising in combination:

a housing;

a panel in said housing having a cassette cartridge receiving opening therein;

a cassette holder located within said housing in a first position aligned with said cassette cartridge receiving opening and having a door pivotally mounted thereon to close said opening with no cassette therein, said door pivoted to permit entry of a cassette into said cassette holder, said holder being movable from said first position to a second position wherein a cassette in said holder engages the tape drive mechanism of said player; and

an indicator means mounted for movement with said cassette holder so that when said cassette holder moves to said second position, said indicator means is aligned with said receiving opening in said panel to indicate the presence of a cassette in playing position.

3,947,884

TAPE RECORDER

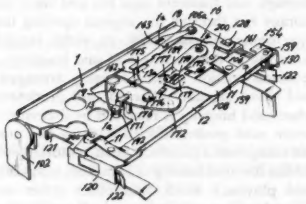
Tadashi Yokota; Chiaki Yanagi, and Toyoji Hara, all of Toda, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Oct. 2, 1973, Ser. No. 402,709

Claims priority, application Japan, Oct. 4, 1972, 47-114561[U]; Oct. 13, 1972, 47-117704[U]; Jan. 16, 1973, 48-7244

Int. Cl.² G11B *15/18, 15/04, 21/02, 15/02*

U.S. Cl. 360—96 **9 Claims**



1. A tape recorder comprising a frame, a deck provided with a pair of reel drive shafts, a motor, means connecting said motor to selectively drive either one of said reel drive shafts, a cassette guide member having an opening for receiving the reproduce side of a cassette, a pivotally movable frame means including a pivot shaft and resilient plates pivotally attaching said cassette guide means to said deck for lowering the cassette guide member to a predetermined lower operative position and to raise it to an inoperative position, said pivotally movable frame having a protrusion, a head mounting plate provided with a recording and reproducing head and at least one pinch roller, a slide piece having a pin, means slidably mounting said slide piece on said deck; a suspending piece having a tip, means loosely pivoting said suspending piece at one end to said pivotally movable frame, a toggle spring hooked across the tip of said suspending piece and the pivot shaft of said pivotally movable frame, a locking lever, means pivotally attaching said locking lever to said frame, said slide piece having a guide hole that engages with the protrusion provided on said pivotally movable frame, a spring expanded between said locking lever and said pivotally movable frame and forming a locking part releasably engaging the pin of said slide piece and further having an engaging part that engages with said suspending piece, said suspending piece having a pair of downwardly extending protrusions engaging with the reproduce side and the step formed on said reproduce side of a cassette, said pivotally movable frame formed with a cut-out for receiving said downwardly extending protrusions, and further having a guide member engaging the tip of said suspending piece in said cut-out for guiding the motion of said suspending piece, and further having an upwardly tilted part in said cut-out for pushing-up said suspending piece when moved, said suspending piece further having a contact part which releasably engages with said tilted push-up part whereby when the cassette is being inserted, the reproduce side pushes the protrusion on one side of the suspending piece and then the contact part is released from the tilted push-up part, so that other protrusion of the suspending piece comes into contact with the step of the cassette, and under this condition the restoring action of the toggle spring in passing its dead point automatically pulls the cassette into the front opening.

3,947,885

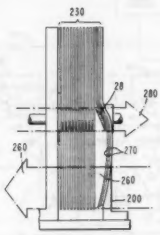
RESTRAINT DEVICE FOR BUCKLING A FLEXIBLE MAGNETIC DISK STACK UPON PARTITIONING

Bernard W. McGinnis, Poughkeepsie; Anthony W. Orlando, Highland, and James A. Weidenhammer, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 1, 1974, Ser. No. 484,829

Int. Cl.² G11B *5/012, 5/016*

U.S. Cl. 360—98 **7 Claims**



1. In a flexible disk recording device wherein a stack of flexible disks are mounted for rotation on a spindle and a splitter means is provided for spreading apart any two directly adjacent disks by deflecting a portion of said stack toward one end of the spindle, the improvement comprising:

a restraint means for developing a restraining force to counter the forces of deflection, said restraint means situated in juxtaposition to a small arcuate portion of the outer surface of the end disk in said stack at the end toward which said portion is deflected, said restraint means angularly positioned subsequent to said splitter means in the direction of disk rotation.

3,947,886

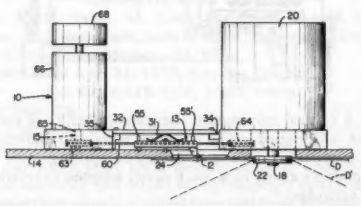
FLEXIBLE DISC RECORDING APPARATUS

Robert F. Hiedecker, Longmont; A. Kenneth Johnson, and Galen B. Royer, both of Boulder, all of Colo., assignors to Dynastor, Inc., Denver, Colo.

Filed Apr. 25, 1974, Ser. No. 464,054

Int. Cl.² G11B *5/82, 21/08, 17/26*

U.S. Cl. 360—99 **12 Claims**



1. In a magnetic head positioning apparatus for reading and writing information, the combination comprising:

drive means having a drive shaft extending therefrom,

a reference plate having said drive means attached in fixed relation on one side thereof with said drive shaft extending axially through a port located centrally of said reference plate, said reference plate having an elongated slot therethrough positioned in spaced relation from said port but radially oriented relative thereto, and said port communicating with an air flow orifice adjacent to said port,

a flexible disc recording medium,

a read/write head,

a head carrier mounted on said one side of said reference plate and including bearing means supporting said head for extension through said elongated slot for linear move-

ment over a selected distance corresponding to the radial distance of the recordable surface on said flexible disc recording medium,

means for securing said flexible disc recording medium on said drive shaft into position adjacent to a flat surface portion on the other side of said reference plate opposite to said head carrier and into operative engagement with said drive means whereby to spin said disc at a speed sufficient to raise said disc into a substantially flat plane of rotation in proximity to the flat surface on the other side of said reference plate,

a housing having an opening thereinto but otherwise being attached to said reference plate in air-tight enclosing relation to said reference plate slot and the intake of said air flow orifice, air filter means covering said housing opening, and

means establishing a flow of air from said one side of said reference plate through said reference plate port for establishing a first air bearing interface between said disc and the flat surface of said reference plate to maintain said disc in its flat plane of rotation in close proximity to said reference plate and to establish a second air bearing interface between said disc and said head to establish a slight spacing therebetween in reading and writing information on said recording medium.

3,947,887

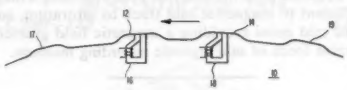
TRANSDUCER HEAD CONTOUR AND METHOD OF GENERATING SAME

Sandford Platter, Boulder, Colo., assignor to Storage Technology Corporation, Louisville, Colo.

Filed Apr. 3, 1975, Ser. No. 564,682

Int. Cl.² G11B *15/64*

U.S. Cl. 360—103 **13 Claims**



1. The method of forming the working surface of a transducer head assembly for receiving a transported magnetic tape, comprising the steps of:

grinding the working surface to form three depressions extending across the head assembly transverse to the direction of tape travel to define four upstanding bearing areas,

the outer two of said bearing areas each comprising a arcuate surface having a radius of no greater than substantially 0.015 inch substantially tangent to the outer edge of ones of said depressions, a second arcuate surface having a radius of substantially 0.5 inch contiguous with said first arcuate surface, and an elongate ramp-like surface extending from said second arcuate surface;

the inner two of said bearing areas each having core means generally centrally located therein for interacting with magnetized areas on said tape;

the inner two of said bearing areas each comprising a first generally central arcuate surface having a radius of from 0.5 to 0.75 inches, second arcuate surfaces contiguous with said first surface and having radii of substantially from 0.1 to 0.2 inches, and third generally arcuate surfaces contiguous with said second surfaces and having radii of up to 0.015 inch;

abrading said arcuate surfaces of said bearing areas with an elongate web having an abrasive surface and oriented in substantially the same position as a tape to be transported by the steps of:

placing said web under a tension of substantially 90% of the lowest tension to be encountered by said tape during a drive cycle;

i. passing a new length of said web over said bearing surfaces in a forward tape transport direction at approximately 200 ips and in a reverse tape transport direction at approximately 600 ips;

ii. passing a used length of said web over said bearing surfaces in a forward tape transport direction at approximately 200 ips and in a reverse tape transport direction at approximately 600 ips;

iii. repeating step (ii) twice; and

iv. repeating step (i) once.

3,947,888

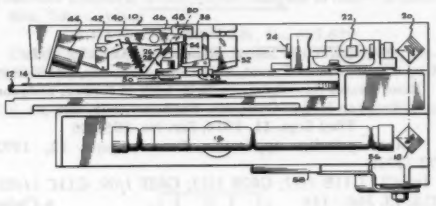
HYDRODYNAMIC BEARING HEAD PROVIDING CONSTANT SPACING

Manfred H. Jarsen, Encino, Calif., assignor to MCA DiscoVision, Inc., Universal City, Calif.

Filed Oct. 1, 1973, Ser. No. 402,635

Int. Cl.² G11B *5/60, 17/32, 21/16, 5/016*

U.S. Cl. 360—103 **10 Claims**



1. In an information handling system including an information bearing medium having indicia established therein and having a surface, and a transducer head assembly for communicating with the medium and adapted to access the surface, the transducer head assembly having a surface for generating a hydrodynamic bearing and being supported at a predetermined distance interval from the surface by a hydrodynamic bearing created by relative motion between the medium surface and the transducer hydrodynamic bearing generating surface while being immersed in a fluid medium, apparatus for modifying the interval between the transducer and the medium surface comprising:

a. a source of fluid under less than ambient pressure; and

b. communicating means between said less than ambient pressure fluid source and the area between the transducer head assembly and the medium surface, said means being coupled to the transducer head assembly and carried thereby,

whereby the relative spacing defining the interval between the transducer head assembly and the medium surface is changed by modifying the fluid pressure existing in the interval between the transducer head assembly and the medium surface.

3,947,889

ELECTROMAGNETIC TRANSDUCERS

Jean-Pierre Lazzari, Montfort l'Amaury, France, assignor to Compagnie Internationale pour l'Informatique, Louveciennes, France

Filed Nov. 5, 1974, Ser. No. 521,031

Claims priority, application France, Oct. 23, 1973, 73.37697

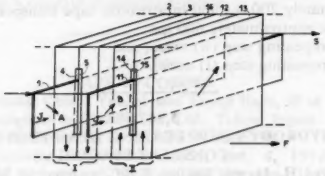
Int. Cl.³ G11B *5/30, 5/16, 5/22*

U.S. Cl. 360—113 **7 Claims**

1. Electromagnetic transducer member comprising the combination of:

a magnetoresistive layer having its easy magnetization axis 45° to the direction of passage of an electrical current and having an edge 90° to said direction,

a pair of high permeability thicker magnetic layers enclosing the said magnetoresistive layer and contacting each other on both sides of the height of the magnetoresistive layer 90° to said edge, and,



means coupling each of said thicker layers to said magnetoresistive layer in leakage field magnetostatic coupling relation.

3,947,890

MAGNETO-OPTICAL READOUT APPARATUS

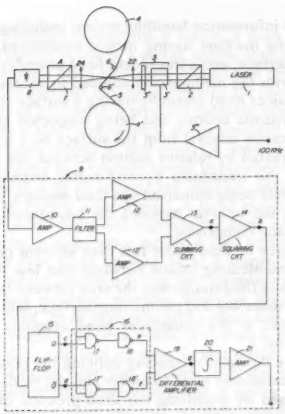
Guy Claude Daniel Travot, Saint-Mur-des-fosses, and Gerard Rene Sirand-Rey, Roissy-en-Brie, both of France, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 11, 1974, Ser. No. 505,106

Claims priority, application France, Sept. 12, 1973, 73.32715

Int. Cl.² G11B *5/32*; **G02B** *5/23*; **G02F** *1/09*; **G11C** *11/02*

U.S. Cl. 360—114 **6 Claims**



1. An optical apparatus for reading magnetic records on a recording medium, comprising:

a. means for beaming light, which is polarized in a first direction, onto such a recording medium whereby there is caused a rotation of the direction of polarization of said beam in accordance with the magnetic characteristics of the magnetic records thereon;

b. oscillator means for causing a periodic oscillation in the direction of beam polarization at a preselected oscillator frequency;

c. detector means, located in the path of said light beam after said recording medium and said oscillator means, for receiving said beam and for producing a first substantially periodic signal having alternating components in accordance with the angle of the instantaneous polarization direction of said beam in relationship to said first direction; and

d. circuit means for receiving said first signal and for producing a second signal based thereon which is representative of the characteristics of the magnetic record, said circuit means being responsive to the relative duration intervals for adjacent similar-polarity segments of the alternating component of said first signal.

3,947,891

STATIC MAGNETIC ERASING HEAD

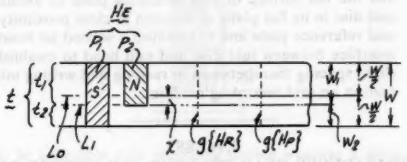
Makoto Saito, Omiya; Kengo Matsumoto, and Kiyonori Hayakawa, both of Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sept. 27, 1974, Ser. No. 509,947

Claims priority, application Japan, Oct. 2, 1973, 48-110866; Oct. 2, 1973, 48-115041[U]

Int. Cl.² G11B *5/12, 5/27*

U.S. Cl. 360—118 **8 Claims**



1. A magnetic erasing head comprising at least two magnetic poles arranged to contact a track of a traveling magnetic recording medium, the first of said poles having one magnetic polarity and engaging substantially the full width of said track, and the second of said poles being of lesser width than said first pole and engaging less than full width of said track and being of opposite polarity, said first pole providing a magnetic field sufficient to magnetize said track to saturation, and the second of said poles providing a magnetic field greater than the coercive force of said mgnetic recording medium.

3,947,892

HELICAL SCAN TYPE TAPE CASSETTE HAVING TAPE THREADING MEANS

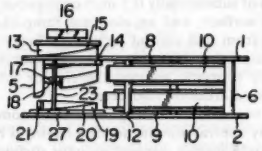
Teruo Saito; Hideki Seki, and Mamoru Hiroyasu, all of Saijo, Japan, assignors to Matsushita Electric Industrial Company, Ltd., Osaka, Japan

Filed May 29, 1974, Ser. No. 474,347

Claims priority, application Japan, May 30, 1973, 48-61301; May 30, 1973, 48-61302; May 30, 1973, 48-61303; May 30, 1973, 48-61304

Int. Cl.² G11B *23/04, 15/66*

U.S. Cl. 360—132 **4 Claims**



1. A tape cassette for use with a main tape recording apparatus having a tape guide of a circular cylindrical shape housing a rotating head, comprising:

a. an upper plate and a lower plate each having a through hole;

b. support members, connecting said upper plate and said lower plate with a predetermined gap between said upper and lower plates to form an inner space therebetween, said support members connecting said upper and lower plates to align the through holes;

c. a first rotatable cylindrical member consisting of a single cylinder and having a hollow opening facing said lower plate for accomodating the tape guide;
d. holding means for rotatably holding said first cylindrical member on said upper plate to enable said first cylindrical member to freely enter and exit said inner space through said through hole in said upper plate on rotation of said first cylindrical member, said through hole in said lower plate being positioned such that the tape guide is introduced into said inner space through said lower plate through hole when the tape cassette is mounted on the main tape recording apparatus;
e. a supply reel and a take-up reel respectively rotatably connected in said inner space to one of said upper and lower plates; and
f. a magnetic tape fed from said supply reel, wound helically on said single cylinder and taken up by said take-up reel, said single cylinder including on its outer surface a helical projection having a pitch approximately equal to the width of the magnetic tape, said holding means including a support ring, around said upper plate through hole, having a screw groove to engage said helical projection.

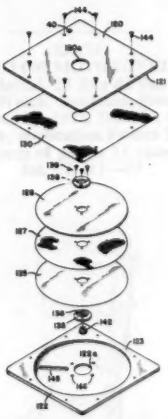
3,947,893
RECORDING CASSETTE INCLUDING COMPLIANT MAGNETIC RECORDING DISC HAVING FLEXIBLE SUPPORT MEANS

Robert P. Hall, Sr., Auburn, Calif., assignor to Arvin Industries, Inc., Columbus, Ind.

Division of Ser. No. 305,335, Nov. 10, 1972, Pat. No. 3,833,926, which is a continuation-in-part of Ser. No. 266,582, June 27, 1972, abandoned. This application May 3, 1974, Ser. No. 466,783

Int. Cl.[2] G11B *23/02, 5/016*

U.S. Cl. 360—133 **13 Claims**



1. A magnetic recording cassette comprising
a rotatable hub including means for driving engagement with a rotatable driving member,
a recording disc of thin flexible material incapable of sustaining itself in a plane, said recording disc having a front and a back surface, at least the front surface being a magnetizable surface, said disc being attached to said hub near the disc center and free of any attachment at the outside thereof,
flexible backing disc means separate from and in supportive contact with substantially the entire back surface of said flexible recording disc and attached near its center to said hub for rotation with said hub and recording disc to provide additional support for said recording disc to provide a compliant backing for said flexible recording disc for compliant interfacing with such a transducer,
a hollow cassette surrounding and enclosing said discs and having a thin chamber therein within which said discs are freely rotatable,
said cassette including an upper section and a lower section at least one of which has a drive opening surrounding said hub and providing access thereto, and
said cassette having a further opening adjacent to the magnetizable surface and elongated crosswise of said recording disc for providing access for a transducer to a wide band around said surface upon rotation of said disc within said cassette.

3,947,894
MODE SELECTING DEVICE FOR TAPE RECORDING AND/OR REPRODUCING WITH RELEASABLE LOCK

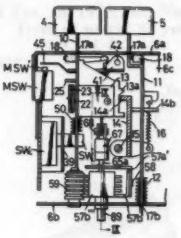
Toshihiko Chimura, Atsugi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 20, 1974, Ser. No. 525,679

Claims priority, application Japan, Nov. 24, 1973, 48-135592[U]

Int. Cl.[2] G11B *15/02, 15/04, 15/10*

U.S. Cl. 360—137 **15 Claims**



1. A mode selecting device for a tape recording and/or reproducing apparatus: comprising a plurality of operating mode selecting push-button members which are selectively actuable from rest positions to active positions for selecting corresponding operating modes of the apparatus; a stop push-button member actuable from a rest position to an active position for halting any previously selected operating mode of the apparatus; an electrically energizable driving means; circuit means for momentarily energizing said driving means in response to the actuation of any one of said operating mode selecting push-button members to the active position of the latter; an operating member connected with said driving means and being movable from an inoperative position to an operative position in response to the momentary energizing of said driving means and being urged to return to said inoperative position upon deenergizing of said driving means; locking means having a normal locking condition for locking said operating member in said operative position and a released condition for freeing said operating member to return to said inoperative position; lock releasing means for establishing said released condition of said locking means in response to the actuation of said stop push-button member to said active position thereof; and a plurality of transmission members respectively corresponding to said operating mode selecting push-button members and each being coupled with said operating member in response to actuation of the corresponding push-button member for establishing the corresponding operating mode of the apparatus by the movement of said operating member to said operative position of the latter.

3,947,895

MAGNETIC TAPE RECORDER

Shoji Suzuki, Iwaki, Japan, assignor to Alps Motorola, Inc., Tokyo, Japan

Filed Jan. 16, 1975, Ser. No. 541,429

Claims priority, application Japan, Feb. 27, 1974, 49-23645[U]

Int. Cl.² G11B *15/24*; B65H *17/48*

U.S. Cl. 360—137 **7 Claims**

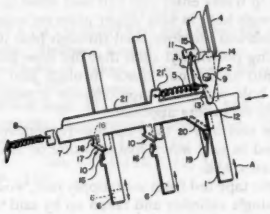
1. In a tape recorder having a plurality of function control levers associated with a locking plate used for controlling the operation of a tape recorder, an improvement including in combination:

a cam member pivotally mounted on one of said control levers;

a projection on said locking plate extending in a different plane from the plane of said locking plate;

spring means interconnecting said cam member and said locking plate, urging the cam member into abutment with the projection on said locking plate thereby to rotate the cam member from a first position to a second position with the locking plate being displaced from a first position to a second position; and

means operated by said cam member for ejecting a cassette from the tape recorder when said one control lever is

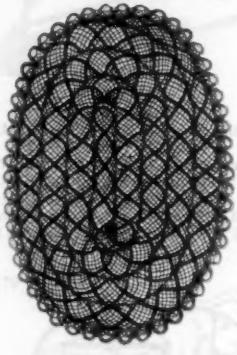


moved from a first to a second position thereof with said locking plate in the first position thereof.

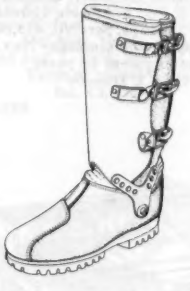
DESIGNS

MARCH 30, 1976

239,340
PLACE MAT
Virginia J. Cromwell, Newport Beach, Calif., assignor to W/C Imports, Hawthorne, Calif.
Filed Feb. 26, 1973, Ser. No. 335,559
Term of patent 14 years
Int. Cl. D6—*13*
U.S. Cl. D2—272

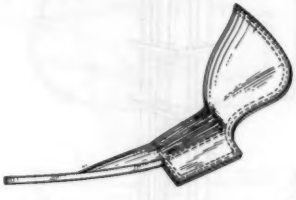


239,341
BOOT FOR MOTORCYCLISTS
Etienne Heckel, 13 Rue de Bitschhoffen, La Walck, Bas-Rhin, France
Filed June 21, 1974, Ser. No. 481,862
Claims priority, application France Dec. 21, 1973
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—275

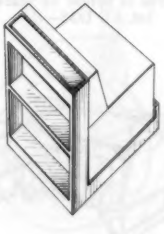


239,342
SPORTS SHOE
Horst Rudolf Dassler, Eckartswiller, France, assignor to Societe a Responsabilite Limitee dite: ADIDAS Fabriques de Chaussures de Sport
Filed Nov. 26, 1973, Ser. No. 418,845
Claims priority, application France May 24, 1973
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—310

239,343
COMBINED TOE PIECE AND TONGUE MEMBER FOR A SHOE
Jerome Pankin, New York, N.Y., and Beverly Ann Feldman, Alicante, Spain, assignors to Pankin International, Ltd.
Filed Apr. 18, 1975, Ser. No. 569,285
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—315

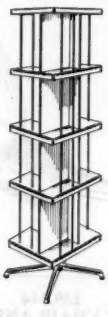


239,344
INVERTIBLE CHAIR AND BOOKCASE COMBINATION
John Tam, 333 E. 53rd St. 10019, and Leonard Horowitz, 51 W. 81st St. 10028, both of New York, N.Y.
Filed Mar. 5, 1974, Ser. No. 448,374
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—3

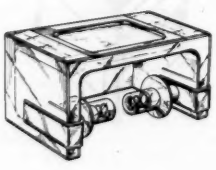


239,345
STACKABLE CHAIR
Robert A. Keller, Grand Rapids, Mich., assignor to Steelcase Inc., Grand Rapids, Mich.
Filed Dec. 30, 1974, Ser. No. 537,670
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—26

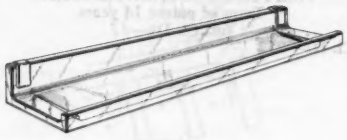
239,346
ROTATABLE BOOK RACK OR SIMILAR ARTICLE
Robert K. Scherzer and Harold L. Hudson, Liverpool, and Gregory G. Mt. Pleasant, Baldwinsville, N.Y., assignors to Gaylord Bros., Inc.
Filed Dec. 20, 1974, Ser. No. 534,877
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—29



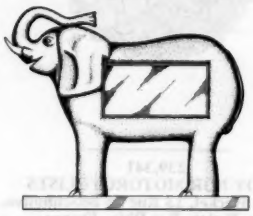
239,347
TOILET PAPER ROLL HOLDER
Guy Vrignaud, Grenoble, France, assignor to Allibert Exploitation Societe Anonyme, Puteaux, France
Filed Nov. 6, 1974, Ser. No. 521,492
Claims priority, application France May 6, 1974
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—97



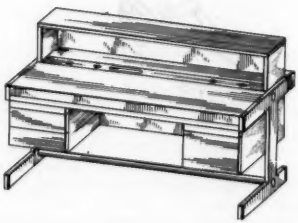
239,348
WASH BASIN SHELF
Guy Vrignaud, Grenoble, France, assignor to Allibert Exploitation Societe Anonyme, Puteaux, France
Filed Nov. 6, 1974, Ser. No. 521,484
Claims priority, application France May 6, 1974
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—136



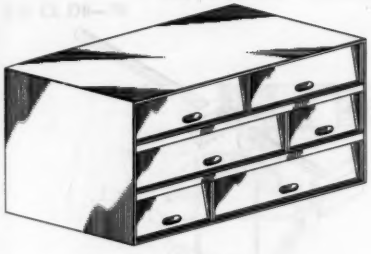
239,349
SHOWCASE
Phillip Small, 5000 Oak, Apt. 1015, Kansas City, Mo. 64112
Filed Apr. 14, 1975, Ser. No. 567,742
Term of patent 14 years
Int. Cl. D6—*04*; D20—*02*
U.S. Cl. D6—152



239,350
DESK OR THE LIKE
Franz Vogt, Pohlheim, Germany, assignor to Voko Franz Vogt & Co., Pohlheim, Germany
Filed Mar. 28, 1974, Ser. No. 455,605
Claims priority, application Germany Nov. 30, 1973
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—161

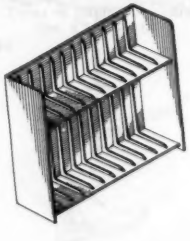


239,351
STORAGE UNIT
John E. Sgombick, Ramsey, N.J., assignor to Xerox Corporation, Stamford, Conn.
Filed May 31, 1974, Ser. No. 475,067
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—166



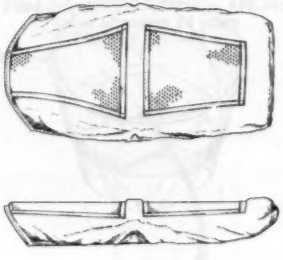
239,352
TABLE OR SIMILAR ARTICLE
Russell E. Petrick, Park Ridge, Ill., assignor to Bretford Manufacturing, Inc., Schiller Park, Ill.
Filed July 23, 1973, Ser. No. 381,724
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—179

239,353
HOLDER FOR CASSETTES OR THE LIKE
Hormoz Rafaat, 709 Narcissus, Corona Del Mar, Calif. 92625
Filed Jan. 2, 1975, Ser. No. 537,956
Term of patent 7 years
Int. Cl. D6—*04*
U.S. Cl. D6—189

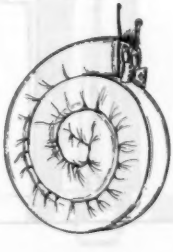


239,354
VENTILATED COVER FOR BICYCLE SEAT
Robert E. Flowers, Rte. 1, 3 Mile Lake Bayshore Drive, Paw Paw, Mich. 49079
Filed Sept. 30, 1974, Ser. No. 510,236
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D6—191

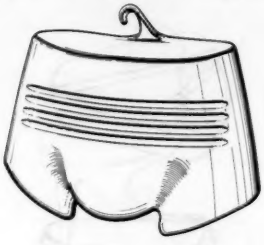
239,355
VENTILATED COVER FOR A MOTORCYCLE SEAT
Robert E. Flowers, Rte. 1, 3 Mile Lake Bayshore Drive, Paw Paw, Mich. 49079
Filed Sept. 30, 1974, Ser. No. 510,237
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D6—191



239,356
CUSHION
Pasquale Cimini, Massa, Italy, assignor to Lucia Benevento, Massa, Italy
Filed Apr. 24, 1974, Ser. No. 463,841
Term of patent 14 years
Int. Cl. D6—*09*
U.S. Cl. D6—203

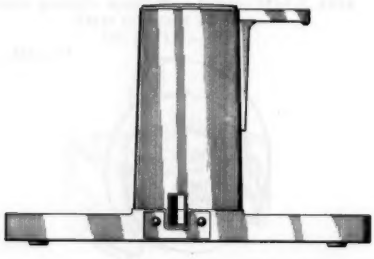


239,357
DISPLAY HANGER
Joseph M. Gindi, 4 Morgan Ave., Deal, N.J. 07723
Filed Aug. 26, 1974, Ser. No. 500,716
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—248

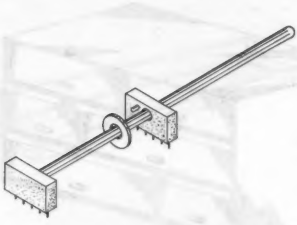


239,358
DRINKING GLASS
Stig Ove Kjellqvist, Halmstad, Sweden, assignor to Duni Bila AB, Halmstad, Sweden
Filed June 6, 1974, Ser. No. 476,874
Claims priority, application Sweden Dec. 10, 1973
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—6

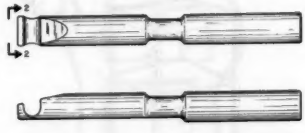
239,359
COFFEE MAKER OR THE LIKE
Arthur J. Schmitt, West Bend, Wis., and William K. Fahey, Longwood, Fla., assignors to Dart Industries Inc., Los Angeles, Calif.
Filed June 20, 1974, Ser. No. 481,026
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—59



239,360
STRETCHER BAR
Jules Kliot, 2150 Stuart St., Berkeley, Calif. 94705
Filed June 11, 1973, Ser. No. 368,932
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—15

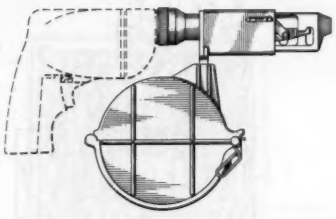


239,361
TIRE TOOL OR THE LIKE
George A. Johnson, Saugus, Calif., assignor to Rojen B
Filed Sept. 23, 1974, Ser. No. 508,444
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—31

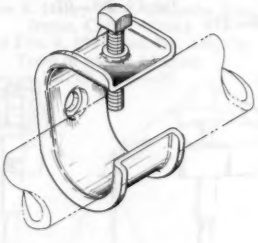


239,362
CORK SCREW
George Frederick Peterson, Boonton Township, N.J., assignor to Etamco Industries, Belleville, N.J.
Filed Sept. 16, 1974, Ser. No. 506,287
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D8—42

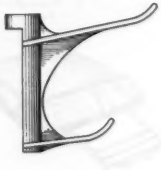
239,363
FASTENER DRIVING TOOL
Allen R. Obergfell, Park Ridge, and Frank R. Potucek and Andrew I. Yohana, Des Plaines, Ill., assignors to Duo-Fast Corporation
Filed Apr. 29, 1974, Ser. No. 464,910
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—70



239,364
CLAMP FOR ELECTRICAL CONDUIT
Thomas Mooney, Mount Sinai, and Stephen Veselaski, Shirley, N.Y., and John Clark, Willow Springs, Ill., assignors to I-T-E Imperial Corporation, East Farmingdale, N.Y.
Filed Apr. 17, 1975, Ser. No. 569,298
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—235



239,365
HINGE HOOK
Steven Havark, 5415 W. Barry Ave., Chicago, Ill. 60641
Filed June 20, 1974, Ser. No. 481,162
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—260



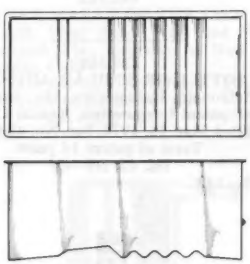
239,366
WINE BOTTLE
Gerard Lasseaux, Reims, France, assignor to Dulong Freres et Fils, Floirac pres Bordeaux, France
Filed Nov. 5, 1973, Ser. No. 412,768
Claims priority, application France May 3, 1973
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—47

239,367
BOTTLE
Paul R. Campbell, Cincinnati, Ohio, and John Pardo, Yonkers, N.Y., assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed July 15, 1974, Ser. No. 488,361
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—60

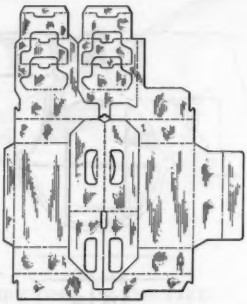
239,368
BOTTLE OR SIMILAR ARTICLE
John W. McDonald, Kansas City, Mo., assignor to Ethyl Development Corporation, Kansas City, Mo.
Filed Mar. 25, 1974, Ser. No. 454,240
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—143

239,369
PACKAGING CONTAINER
Marcus Bressler, 505 Smithfield Ave., Winnipeg, Manitoba, Canada
Filed Nov. 13, 1973, Ser. No. 415,344
Claims priority, application Canada Oct. 23, 1973
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—164

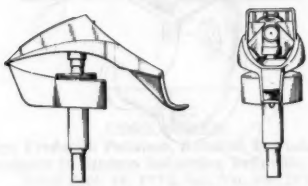
239,370
SHIPPING BOX
Olin H. Baker, Madison, Ind., assignor to Meese Inc., Madison, Ind.
Filed June 11, 1973, Ser. No. 368,764
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—237



239,371
CARTON BLANK
Glen R. Harrelson, Monroe, La., assignor to Olinkraft, Inc., West Monroe, La.
Filed Sept. 26, 1974, Ser. No. 509,533
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—245

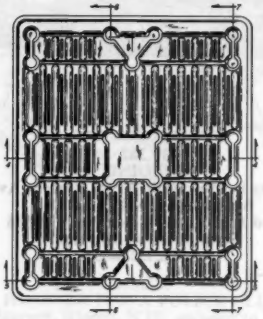


239,372
SPRAYER PUMP
Ray G. Brooks, Irving, Tex., and James C. McKinney, Simpsonville, S.C., assignors to Morton-Norwich Products, Inc.
Filed July 1, 1974, Ser. No. 484,751
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—276

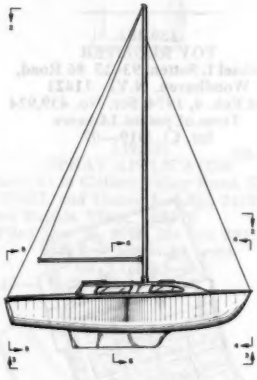


239,373
DIGITAL WRISTWATCH
Claus O. Huckenbeck, 15474 Dickens St., Sherman Oaks, Calif. 91403
Filed July 29, 1974, Ser. No. 492,756
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—38

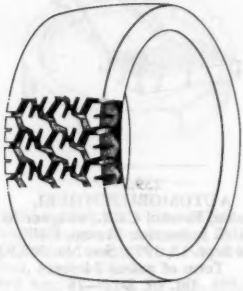
239,374
FORK LIFT TYPE INDUSTRIAL PLATFORM PALLET OR THE LIKE
Charles G. Cardwell, Bartlesville, Okla., and Morris E. Speck, Akron, Ohio, assignors to Phillips Petroleum Company, Bartlesville, Okla.
Filed Sept. 9, 1974, Ser. No. 504,068
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D12—53



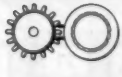
239,375
SAILBOAT HULL
Arthur S. Henry, 5042 Doanoke Ave., Irvine, Calif. 92664
Filed Feb. 4, 1974, Ser. No. 439,376
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—64



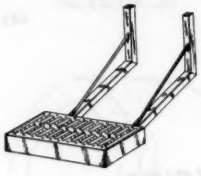
239,376
PNEUMATIC TIRE TREAD AND BUTTRESS
Gerassimos C. Candiliotis, Agawam, Mass., assignor to Uniroyal, Inc.
Filed Jan. 20, 1975, Ser. No. 542,330
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—136



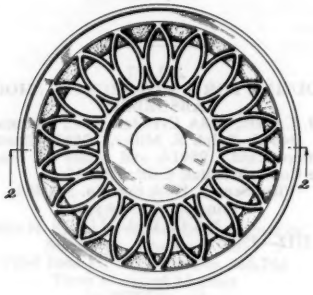
239,377
HOUSING FOR A MOTORCYCLE SHOCK ABSORBER
Eugene J. Castelli, 148A Evendale Ave., Mountain View, Calif. 94043; Ralph S. Miller, 10683 Minette Place, Cupertino, Calif. 95014; and James M. Magee, 392 Firtree Court, Milpitas, Calif. 95035
Filed Sept. 9, 1974, Ser. No. 504,488
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—159



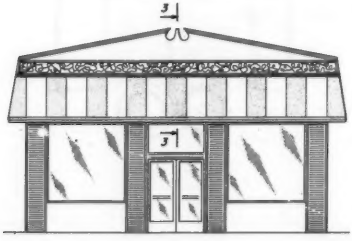
239,378
VEHICLE STEP
Alvin Stecker, Sr., Woden, Iowa 50484
Filed Jan. 23, 1975, Ser. No. 544,937
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—203



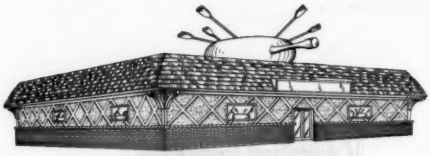
239,379
AUTOMOBILE WHEEL
John Siroonian, Fresno, Calif., assignor to Western U.S. Industries, Fresno, Calif.
Filed Sept. 13, 1974, Ser. No. 505,937
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—205



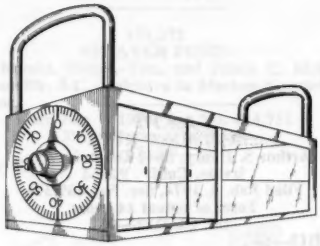
239,380
BUILDING
Thomas Carvel, Chauncy, N.Y., assignor to Carvel Corporation, Yonkers, N.Y.
Filed Aug. 27, 1973, Ser. No. 391,734
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 R



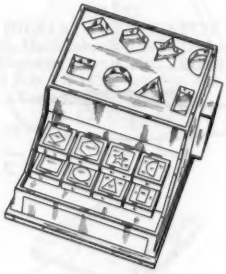
239,381
RESTAURANT
Emmett L. Walsh, Hunting Creek Club Apartments, 2059 Huntington Ave., Alexandria, Va. 22303
Filed Sept. 24, 1973, Ser. No. 399,791
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 B



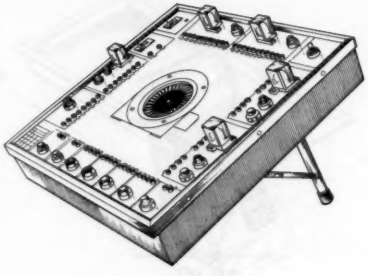
239,382
BUILDING
Anthony P. Moscatelli, 239 N. Queens Ave., Massapequa, N.Y. 11758
Filed July 31, 1974, Ser. No. 493,606
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 F



239,383
TOY REGISTER
Michael I. Satten, 93–25 86 Road, Woodhaven, N.Y. 11421
Filed Feb. 4, 1974, Ser. No. 439,924
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—59

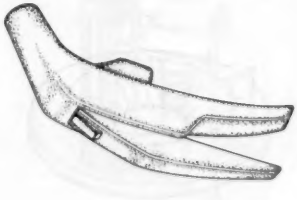


239,384
TRAINING PANEL FOR ELECTRICAL MALFUNCTIONS
Vernon T. Kempf, 194 Edgemond, Barrington, Ill. 60010
Filed Nov. 7, 1974, Ser. No. 521,623
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—62

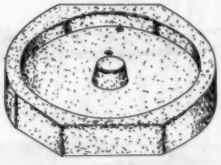


239,385
HOLSTER FOR A POLICE CLUB
Paul D. Starrett, Rindge, N.H., assignor to Monadnock Lifetime Products, Inc., Fitzwilliam, N.H.
Filed Oct. 21, 1974, Ser. No. 516,818
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D22—13

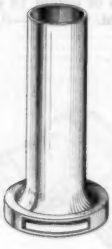
239,386
SPRAY APPLICATOR
Vera A. Slater, 6136 Golden Valley Road, Golden Valley, Minn. 55422, and Duane F. Lilja, 2410 Central Ave. NE., Coon Rapids, Minn. 55418
Filed May 27, 1975, Ser. No. 581,118
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—17



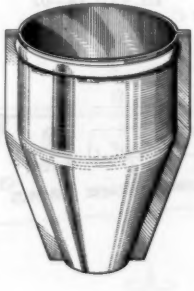
239,387
INSULATING SUPPORT FOR A SHEATHED ELECTRIC SURFACE HEATER
Donald M. Cunningham, 2507 Greensburg Pike, Pittsburgh, Pa. 15601
Filed Sept. 21, 1973, Ser. No. 399,379
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—127



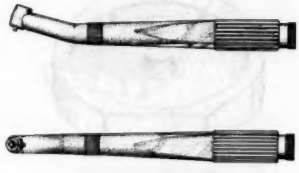
239,388
NOZZLE FOR VENTILATING AIR
Birger Larkfeldt, Odensjo-Barnarp, and Lennart Widerby, Jonkoping, Sweden, assignors to Aktiebolaget Svenska Flaktfabriken, Nacka, Sweden
Filed Aug. 22, 1974, Ser. No. 499,619
Claims priority, application Sweden Feb. 25, 1974
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—163



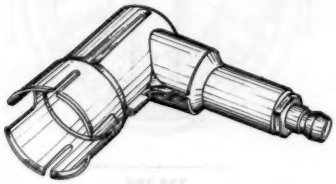
239,389
TUBE FOR VENTILATING AIR
Birger Larkfeldt, Odensjo-Barnarp, and Lennart Widerby, Jonkoping, Sweden, assignors to Aktiebolaget Svenska Flaktfabriken, Necka, Sweden
Filed Aug. 22, 1974, Ser. No. 499,861
Claims priority, application Sweden Feb. 25, 1974
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—163



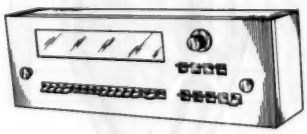
239,390
HAND-HELD HIGH SPEED DENTAL HANDPIECE
Ronald C. Webb, York, Pa., assignor to Dentsply Research & Development Corp., Milford, Del.
Filed Apr. 4, 1974, Ser. No. 457,940
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—1 D



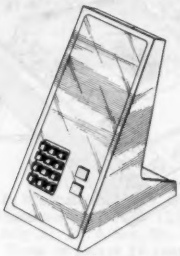
239,391
SUPPRESSOR FOR INTERNAL COMBUSTION ENGINE IGNITION SYSTEMS
Norman Alfred Jukes, Walsall, England, assignor to Joseph Lucas (Electrical) Limited, Birmingham, England
Filed Mar. 1, 1972, Ser. No. 231,091
Claims priority, application Great Britain Oct. 6, 1971
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 A



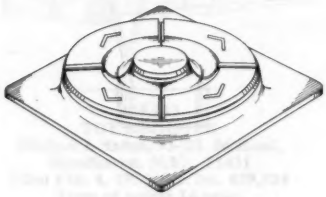
239,392
COMPUTER CABINET
Wilbur C. Baughman, Costa Mesa, Calif., assignor to Xerox Corporation, Stamford, Conn.
Filed Aug. 9, 1974, Ser. No. 495,938
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



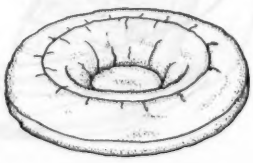
239,393
ELECTRONIC REMOTE CONTROL VIDEO PROGRAM SELECTION DEVICE OR SIMILAR ARTICLE
George R. De Land, Yorba Linda, Calif., assignor to Odetics, Inc., Anaheim, Calif.
Filed June 24, 1974, Ser. No. 482,348
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13 C



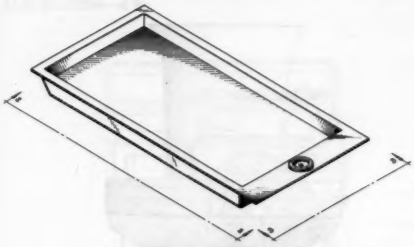
239,394
BUTTON CONTROL UNIT
Gerald M. Adams, Fayetteville, and James H. Frakes, Jr., Manlius, N.Y., assignors to SCM Corporation, New York, N.Y.
Filed July 29, 1974, Ser. No. 492,622
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13 R



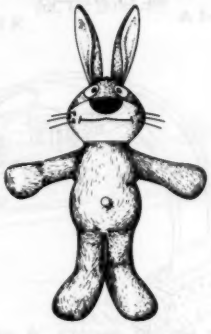
239,395
PET PILLOW
Mildred M. David, 23401 Park Sorrento 10, Calabasas, Calif. 91302
Filed Jan. 25, 1974, Ser. No. 436,498
Term of patent 14 years
Int. Cl. D30—*06*
U.S. Cl. D30—41



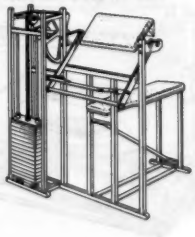
239,396
LABORATORY TRAY FOR COOLING BIOLOGICAL SPECIMENS
Harry James Pappas, Hinsdale, Ill., assignor to Miles Laboratories, Inc., Elkhart, Ind.
Filed Mar. 4, 1974, Ser. No. 447,486
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D32—1 A



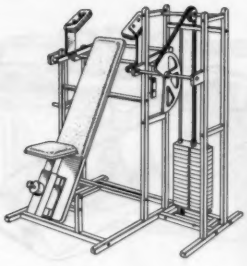
239,397
STUFFED TOY BUNNY
Mary Ann Knapp, Cary, Ill., assignor to Palatine Savings and Loan Association, Palatine, Ill.
Filed Feb. 24, 1975, Ser. No. 552,561
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—2 D



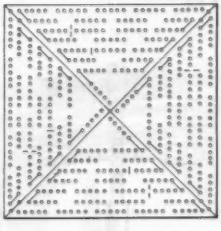
239,398
ARM CURL EXERCISING MACHINE
Robert Clarke, Pacific Beach, Calif., assignor to Paramount Health Equipment Corp., Los Angeles, Calif.
Filed June 24, 1974, Ser. No. 482,100
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 K



239,399
PULLOVER EXERCISING MACHINE
Robert Clarke, Pacific Beach, Calif., assignor to Paramount Health Equipment Corp., Los Angeles, Calif.
Filed June 24, 1974, Ser. No. 482,101
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 K

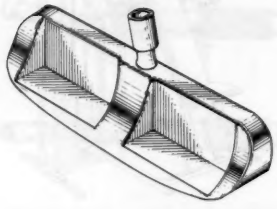


239,400
GAME BOARD
Wilson S. Collins, Digby, Nova Scotia, Canada
Filed July 17, 1974, Ser. No. 489,108
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 TT

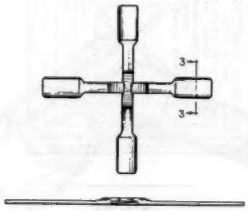


239,401
GOLF CLUB
Lawrence E. Kindred, 1749 Crofton Parkway, Crofton, Md. 21113
Filed Nov. 5, 1974, Ser. No. 521,072
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GC

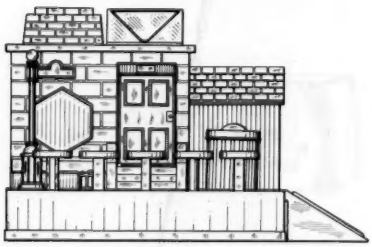
239,402
GOLF CLUB HEAD
Lawrence E. Kindred, 1749 Crofton Parkway, Crofton, Md. 21113
Filed Nov. 5, 1974, Ser. No. 521,073
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH



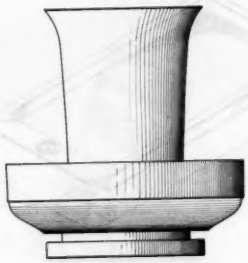
239,403
TOY BOOMERANG
William M. Jarvis, 1430 Holly Ave., Eugene, Oreg. 97401
Filed July 5, 1973, Ser. No. 376,425
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 PP



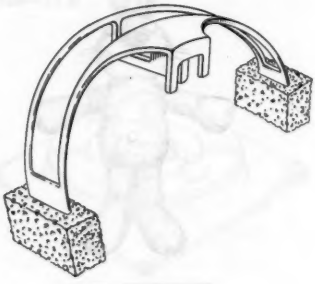
239,404
PUSH BUTTON TOY
Michael I. Satten, 245—20 Grand Central Parkway, Bellrose, N.Y. 11362
Filed Jan. 23, 1975, Ser. No. 543,404
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 LL



239,405
FLOWER ARRANGER
Robert H. C. M. Daenen, Erembodegem, and Pieter K. J. De Coster, Aalst, Belgium, assignors to Dart Industries Inc., Los Angeles, Calif.
Filed July 29, 1974, Ser. No. 492,802
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D35—3 R

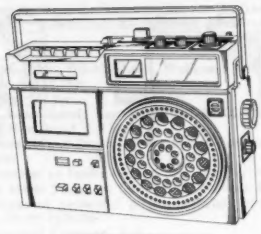


239,406
BRIDGE MOUNTABLE STRINGED INSTRUMENT BOW GUIDE
Richard O. Gordon, 91 S. Jane Ann Way, Campbell, Calif. 95008
Filed May 23, 1974, Ser. No. 472,639
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1 A



239,407
LASER AUDIO/VIDEO RECORD PLAYER
Rebertus van de Poel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Feb. 20, 1974, Ser. No. 444,160
Claims priority, application Switzerland Aug. 27, 1973
Term of patent 14 years
Int. Cl. D14—*01, 03*
U.S. Cl. D56—4 R

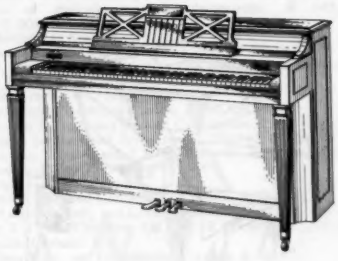
239,408
COMBINED PORTABLE RADIO AND CASSETTE PLAYER
Shuhei Taguchi, Moriguchi, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan
Filed June 19, 1974, Ser. No. 480,772
Claims priority, application Japan Dec. 25, 1973
Term of patent 14 years
Int. Cl. D14—*01, 03*
U.S. Cl. D56—4 B



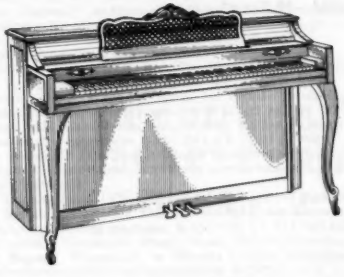
239,409
PHONOGRAPH
Leonard Kaye, Westfield, N.J., assignor to Capehart Corporation, New York, N.Y.
Filed Nov. 14, 1974, Ser. No. 523,841
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D56—4 R

239,410
PIANO
Winsor D. White, Jr., Chicago, Ill., and Dennis Barket, Cincinnati, Ohio, assignors to D. H. Baldwin Company
Filed Aug. 26, 1974, Ser. No. 500,396
Term of patent 14 years
Int. Cl. D17—*01*
U.S. Cl. D56—9

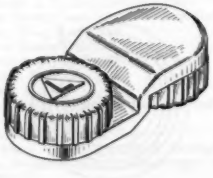
239,411
PIANO
Winsor D. White, Jr., Chicago, Ill., and Dennis Barket, Cincinnati, Ohio, assignors to D. H. Baldwin Company
Filed Aug. 26, 1974, Ser. No. 500,397
Term of patent 14 years
Int. Cl. D17—*01*
U.S. Cl. D56—9



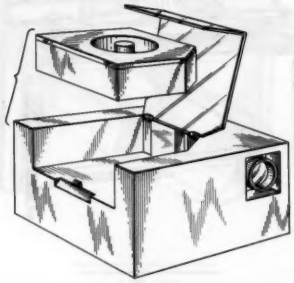
239,412
PIANO
Winsor D. White, Jr., Chicago, Ill., and Dennis Barket, Cincinnati, Ohio, assignors to D. H. Baldwin Company
Filed Aug. 29, 1974, Ser. No. 501,839
Term of patent 14 years
Int. Cl. D17—*01*
U.S. Cl. D56—9



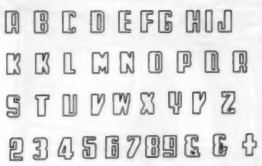
239,413
CONTACT LENS CARRYING CASE
Paul A. Hoogesteger, Penfield, and John Kadlecik, Macedon, N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed July 22, 1974, Ser. No. 490,537
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1 B



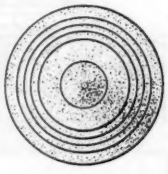
239,414
COMBINED SLIDE PROJECTOR AND MAGAZINE THEREFOR
Serge Besancenot, 38 Quai de Jemmapes, Paris 10, France
Filed Mar. 28, 1973, Ser. No. 345,755
Claims priority, application France Oct. 3, 1972
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D61—1 J



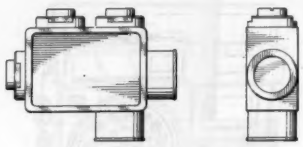
239,415
FONT OF TYPE
Robert I. Harris, Providence, R.I., assignor to Brite Industries Inc.
Filed Oct. 29, 1974, Ser. No. 518,623
Term of patent 14 years
Int. Cl. D18—*03*
U.S. Cl. D64—12 B



239,416
EAR PLUG OR THE LIKE
Frederick C. Visor, Englewood Cliffs, N.J., assignor to Flents Products Co., Inc., New York, N.Y.
Original design application May 29, 1973, Ser. No. 364,855, now Patent No. 234,321. Divided and this application July 3, 1974, Ser. No. 485,649
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—1 J

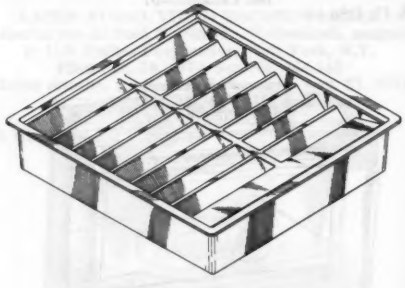


239,417
INFLATION CONTROL FOR UNDERWATER DIVING VESTS
Manfred Schuler, Costa Mesa, Calif., assignor to Pittman Products, Inc., Huntington Park, Calif.
Filed Sept. 13, 1974, Ser. No. 505,790
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D83—1 L



239,418
WEARABLE PURSE
Roger Bowman, Medford, N.J., assignor to Aggogle Inc.
Filed Dec. 10, 1973, Ser. No. 423,162
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—1 R

239,419
TAPE CASSETTE STORAGE UNIT
Robert A. Clowe, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Sept. 26, 1974, Ser. No. 509,364
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 D



INDEX OF APPLICANTS AND ASSIGNEES

OF

PATENT APPLICATIONS PUBLISHED ON THE 30TH DAY OF MARCH, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Abdallah, Abdulmuniem H.; and Shea, Philip J., to Dow Chemical Company, The. Naphthalene acetamidines as anxiolytic antidepressants. B 510,957, Cl. 424-326.000.

Adelstein, Gilbert W.; and Sause, H. William, to G. D. Searle & Co. 2- 3-[4-Azatricyclo(4.3.1.1^{3,8})-undecan-4-yl]1,1-diphenylpropyl - 5-methyl-1,3,4-oxadiazole and congeners. B 568,405, Cl. 260-307.00G.

Adolphi, Heinrich; Wunsch, Gerd; and Kiener, Volker, to BASF Aktiengesellschaft. Substituted fluorophosphazenes. B 484,437, Cl. 260-927.00N.

Agfa-Gevaert Aktiengesellschaft: *See*—
Bergthaller, Peter; Himmelmann, Wolfgang; and Schranz, Karl-Wilhelm, B 481,190.

Agfa-Gevaert, N. V.: *See*—
Gilliams, Yvan Karel; Van Engeland, Jozef Leonard; and De Volder, Noel Jozef, B 376,749.

Aguettant, Georges; and Doyen, Louis. Sealed container. B 459,190, Cl. 150-8.000.

Albertazzi, Gastone, to Finike Italiana Marposs-Soc. In Accomandita Semplice di Mario Possati & C. Measuring device for gauging mechanical pieces in particular pieces including rotation surfaces. B 540,888, Cl. 33-143.00F.

American Cyanamid Company: *See*—
Takeya, Kenji; Suzuki, Hiroshi; and Yamawaki, Noboru, B 388,675.
Takeya, Kenji; Suzuki, Hiroshi; and Ichimaru, Tadashi, B 487,529.
Ueno, Eichiro; Kawasaki, Hideo; and Shigita, Shozo, B 424,410.

Arnold, Charles B.: *See*—
Risgin, Ojars; and Arnold, Charles B., B 374,553.

Babbitt, John M.; and Houle, James F., to Eastman Kodak Company. Element comprising a coating layer containing a mixture of a cationic perfluorinated alkyl and an alkylphenoxy-poly(propylene oxide). B 501,379, Cl. 428-412.000.

Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See*—
Kuerten, Heribert; Nagel, Otto; Sinn, Richard; Weinle, Werner; and Engler, Peter, B 335,783.
Merkle, Hans Rupert; and Siegel, Hardo, B 359,768.

Ball Corporation: *See*—
Van Oosterhout, Jack T., B 520,227.

BASF Aktiengesellschaft: *See*—
Adolphi, Heinrich; Wunsch, Gerd; and Kiener, Volker, B 484,437.
Pistor, Hans Joachim; Hoffmann, Herwig; Joschek, Hans-Ingo; and Wenner, Gotthilf, B 518,076.

Bayer Aktiengesellschaft: *See*—
Hinsche, Friedrich; and Schaupp, Kurt, B 459,821.
Muschelknautz, Edgar; Lenz, Hans; and Herold, Heiko, B 487,078.

Beckmann, Oskar, to Siemens Aktiengesellschaft. Circuit for controlling a semi-conductor valve. B 529,925, Cl. 340-171.00R.

Beloit Corporation: *See*—
Brenner, Lawrence A.; and Scholl, Charles H., B 452,944.

Berger, Wolfgang; and Rottger, Hans, to Siemens Aktiengesellschaft. Steam generator, tube-bundle centering arrangement. B 488,836, Cl. 165-162.000.

Bergthaller, Peter; Himmelmann, Wolfgang; and Schranz, Karl-Wilhelm, to Agfa-Gevaert Aktiengesellschaft. Method of hardening a protein-containing layer of a silver halide photographic material with an alkyl ester of 1,2-dihydroquinoline-N-carboxylic acid. B 481,190, Cl. 96-50.0PT.

Bildusas, Leon L., to General Binding Corporation. Method of making embossable monolithic identification credit card. B 480,591, Cl. 156-220.000.

Black, Robin Michael: *See*—
White, Alan Chapman; and Black, Robin Michael, B 490,812.

Bondy, Clemens, to Revertex Ltd. Method for enlarging the particle size of polymers prepared by aqueous emulsion polymerization. B 358,260, Cl. 260-29.7PT.

Borg-Warner Corporation: *See*—
Reed, David F., B 511,907.

Boudreau, Jerry N.: *See*—
Reardanz, Eugene H.; and Boudreau, Jerry N., B 441,789.

Breitschwerdt, Werner; and Knoll, Heinz W., to Daimler-Benz Aktiengesellschaft. Device for the rapid disengagement of a retaining system in vehicles. B 363,565, Cl. 280-150.0SB.

Brenner, Lawrence A.; and Scholl, Charles H., to Beloit Corporation. Paper roll handling apparatus. B 452,944, Cl. 198-25.000.

Brinkmann, Hans; Eisele, Gottfried; Gormar, Helmut; Pabst, Horst; Putz, Helmut; Schrick, Hans Jurgen; and Sommermeyer, Uwe, to Dynamit Nobel Aktiengesellschaft. Process for the extrusion of a plastic foil having small variations in thickness. B 579,153, Cl. 264-37.000.

Buchler, Wolfram: *See*—
Waller, Eugen; Buchler, Wolfram; Kellenbenz, Rolf; Schneider, Franz; and Schumann, Burkhard, B 561,166.

Burckhardt, Manfred H., to Daimler-Benz Aktiengesellschaft. Servo steering system for vehicles, especially motor vehicles. B 432,594, Cl. 137-627.500.

Burkholder, Ward J., to Goodyear Tire & Rubber Company, The. Purification of dialkylbenzene dihydroperoxide. B 845,044, Cl. 260-610.00A.

Burns, Bernard J.: *See*—
Diamond, Julius; and Burns, Bernard J., B 403,243.

Bushnell, James D. Lube extraction with NMP/phenol/water mixtures. B 476,542, Cl. 208-323.000.

Caterpillar Tractor Co.: *See*—
Schexnayder, Lawrence Francis, B 545,856.

Cawse, James N., to Union Carbide Corporation. Catalytic process for polyhydric alcohols and derivatives. B 526,942, Cl. 260-449.00R.

Chandler, Roy L., to Wood, L Ray. Means for positioning a longitudinal bearing. B 565,754, Cl. 16-129.000.

Ciba-Geigy- Corporation: *See*—
Plattner, Eric; and Comninellis, Christos, B 504,582.

Cohen, Lester Samuel; and Lewis, William Dein, to Du Pont de Nemours, E. I., and Company. Oil filter. B 449,989, Cl. 210-168.000.

Comninellis, Christos: *See*—
Plattner, Eric; and Comninellis, Christos, B 504,582.

Continental Oil Company: *See*—
Lindberg, Carl E., B 510,278.
Reynolds, Edward B., B 513,791.
Stauter, John C.; and Pace, Gerald F., B 369,379.

Corning Glass Works: *See*—
Guile, Donald L.; and Smith, Robert K., B 480,287.

Corson, Ben B.; and Gormley, William T., to Koppers Company, Inc. Isomerization process. B 392,798, Cl. 260-346.300.

Courant, Jacques; Gonnet, Robert; and Thore, Marc, to Zenith-Aviation. Filling valves for pressure fueling devices. B 454,833, Cl. 137-220.000.

Courtaulds Limited: *See*—
Webb, Norman Stanley; and Dunbar, Gordon, B 522,227.

Daimler-Benz Aktiengesellschaft: *See*—
Breitschwerdt, Werner; and Knoll, Heinz W., B 363,565.
Burckhardt, Manfred H., B 432,594.

de Neui, Ricahrd P., to Minnesota Mining & Manufacturing Company. Applicator for pressure-sensitive adhesive fasteners. B 288,757, Cl. 156-461.000.

De Volder, Noel Jozef: *See*—
Gilliams, Yvan Karel; Van Engeland, Jozef Leonard; and De Volder, Noel Jozef, B 376,749.

Diamond, Julius, to William H. Rorer, Inc. Process for making a methenamine salt of an optically active acid. B 332,442, Cl. 260-248.500.

Diamond, Julius; and Burns, Bernard J., to William H. Rorer, Inc. 1,5-Disubstituted biguanides. B 403,243, Cl. 260-293.790.

Doerr, Wendell P.; and Janko, George F., to Hoover Ball and Bearing Company. Chair control with front to rear torsion bar. B 597,410, Cl. 297-304.000.

Dohi, Takashi; Ohara, Kenichi; and Gotoh, Iwao, to Matsushita Electric Industrial Company, Limited. Needle position detector for industrial type sewing machines. B 452,915, Cl. 318-467.000.

Doi, Yasuhiko; Yamamoto, Shunji; Okada, Osamu; Hikosaka, Takashi; and Hayashi, Masamichi, to Minolta Camera Kabushiki Kaisha. Electrophotographic copying apparatus. B 500,171, Cl. 355-11.000.

Douglas, Ellwood S.; Doyle, Richard C.; Nestor, David William; and Wahlgren, Wallace W., to Rucker Company, The. Electric circuit breaker with ground fault protection. B 340,170, Cl. 317-18.00D.

Dow Chemical Company, The: *See*—
Abdallah, Abdulmuniem H.; and Shea, Philip J., B 510,957.

Doyen, Louis: *See*—
Aguettant, Georges; and Doyen, Louis, B 459,190.

Doyle, Richard C.: *See*—
Douglas, Ellwood S.; Doyle, Richard C.; Nestor, David William; and Wahlgren, Wallace W., B 340,170.

Dunbar, Gordon: *See*—
Webb, Norman Stanley; and Dunbar, Gordon, B 522,227.

Dunlop Limited: *See*—
Mitchell, William Eric, B 522,537.

Du Pont de Nemours, E. I., and Company: *See*—
Cohen, Lester Samuel; and Lewis, William Dein, B 449,989.
Lewis, William Dein, B 449,988.
Martin, Elmore Louis, B 573,991.
Stryker, Harvey Irvin, B 444,294.
Temple, Stanley, B 505,221.

Dynamit Nobel AG: *See*—
Vahlensieck, Hans J.; Kotzsch, Hans J.; and Seiler, Claus D., B 412,830.

Dynamit Nobel Aktiengesellschaft: *See*—
Brinkmann, Hans; Eisele, Gottfried; Gormar, Helmut; Pabst, Horst; Putz, Helmut; Schrick, Hans Jurgen; and Sommermeyer, Uwe, B 579,153.

Eastman Kodak Company: *See*—
Babbitt, John M.; and Houle, James F., B 501,379.

Eisele, Gottfried: *See—*
Brinkmann, Hans; Eisele, Gottfried; Gormar, Helmut; Pabst, Horst; Putz, Helmut; Schrick, Hans Jurgen; and Sommermeyer, Uwe, B 579,153.

Engler, Peter: *See—*
Kuerten, Heribert; Nagel, Otto; Sinn, Richard; Weinle, Werner; and Engler, Peter, B 335,783.

Fargo, Harland E., to Owens-Corning Fiberglas Corporation. Production of glass fiber products. B 452,293, Cl. 156-167.000.

Fawkes, David Melville: *See—*
Harvey, Edwin Dennis; Fawkes, David Melville; Lemin, Denis Ronald; and Hawkes, James Anthony, B 389,155.

Finike Italiana Marposs-Soc. In Accomandita Semplice di Mario Possati & C.: *See—*
Albertazzi, Gastone, B 540,888.

Floyd, F. Louis, to SCM Corporation. Process for polymerizing metallocenes. B 522,446, Cl. 260-80.00M.

Friedrich, Dieter: *See—*
Schreiner, Horst; and Friedrich, Dieter, B 519,680.

Fullerton, Richard W. Vehicle washing installation. B 419,364, Cl. 15-53.00A.

Furuya, Toshihiro: *See—*
Sato, Seishiro; Furuya, Toshihiro; and Saito, Yasushi, B 569,293.

G. D. Searle & Co.: *See—*
Adelstein, Gilbert W.; and Sause, H. William, B 568,405.

Gabernig, Heinz: *See—*
Rajakovics, Gundolf; Gabernig, Heinz; and Klein, Gunter Peter, B 328,065.

Games, John E.; Martin, Henry E.; and Walworth, Kirk S., to United Technologies Corporation. Synchro digitizer. B 270,351, Cl. 340-347.0SY.

General Binding Corporation: *See—*
Bildusas, Leon L., B 480,591.

General Foods Corporation: *See—*
Haas, Gerhard J., B 048,560.
Kim, Myung Ki; and Lugay, Joaquin Castro, B 480,987.
Ray, George C., B 337,023.
Reardanz, Eugene H.; and Boudreau, Jerry N., B 441,789.
Zeitlin, Benjamin Raphael; Pritchard, Alan Bryan; and Levenson, Harold S., B 431,797.

Gilbu, Agnar, to Owens-Corning Fiberglas Corporation. Sandwich wall glass fiber reinforced construction and method of making same. B 530,263, Cl. 138-177.000.

Gilliams, Yvan Karel; Van Engeland, Jozef Leonard; and De Volder, Noel Jozef, to Agfa-Gevaert, N. V. Liquid electrophotographic developers. B 376,749, Cl. 252-62.10L.

Goetzewerke Friedrich Goetze A.G.: *See—*
Stettes, Karl-Friedrich; and Korber, Hans-Joachim, B 555,456.

Gonnet, Robert: *See—*
Courant, Jacques; Gonnet, Robert; and Thore, Marc, B 454,833.

Goodyear Tire & Rubber Company, The: *See—*
Burkholder, Ward J., B 845,044.

Gormar, Helmut: *See—*
Brinkmann, Hans; Eisele, Gottfried; Gormar, Helmut; Pabst, Horst; Putz, Helmut; Schrick, Hans Jurgen; and Sommermeyer, Uwe, B 579,153.

Gormley, William T.: *See—*
Corson, Ben B.; and Gormley, William T., B 392,798.

Gotoh, Iwao: *See—*
Dohi, Takashi; Ohara, Kenichi; and Gotoh, Iwao, B 452,915.

Granberg, Frederick M., to International Paper Company. Mold construction having removable base member. B 468,421, Cl. 162-274.000.

Gudelis, David A.; and Shaw, David H. Partial predilution dilution chilling. B 516,625, Cl. 208-33.000.

Guile, Donald L.; and Smith, Robert K., to Corning Glass Works. Hydration resistant fused dolomitic grain and production method therefor. B 480,287, Cl. 106-58.000.

Haas, Gerhard J., to General Foods Corporation. Method of increasing the permeability of cellular materials. B 048,560, Cl. 426-281.000.

Hansen, Robert L.: *See—*
Pavlik, Frank J.; and Hansen, Robert L., B 464,491.

Harris, Douglas H.: *See—*
Janowiecki, Richard J.; Willson, Michael C.; and Harris, Douglas H., B 561,405.

Harvey, Edwin Dennis; Fawkes, David Melville; Lemin, Denis Ronald; and Hawkes, James Anthony, to Imperial Chemical Industries Limited. Dyeing Process. B 389,155, Cl. 8-178.00R.

Hawkes, James Anthony: *See—*
Harvey, Edwin Dennis; Fawkes, David Melville; Lemin, Denis Ronald; and Hawkes, James Anthony, B 389,155.

Hayashi, Masamichi: *See—*
Doi, Yasuhiko; Yamamoto, Shunji; Okada, Osamu; Hikosaka, Takashi; and Hayashi, Masamichi, B 500,171.

Henrie, James O., to Rockwell International Corporation. Thermal recombiner. B 510,682, Cl. 23-277.00R.

Herold, Heiko: *See—*
Muschelknautz, Edgar; Lenz, Hans; and Herold, Heiko, B 487,078.

Hikosaka, Takashi: *See—*
Doi, Yasuhiko; Yamamoto, Shunji; Okada, Osamu; Hikosaka, Takashi; and Hayashi, Masamichi, B 500,171.

Himmelmann, Wolfgang: *See—*
Bergthaller, Peter; Himmelmann, Wolfgang; and Schranz, Karl-Wilhelm, B 481,190.

Hinsche, Friedrich; and Schaupp, Kurt, to Bayer Aktiengesellschaft. Production of plaster floors by the flooding process. B 459,821, Cl. 428-537.000.

Hitachi, Ltd.: *See—*
Mitsui, Nobuo; Watanabe, Akinori; Oohira, Takeshi; Kawauchi, Kazuhiko; Nakao, Shoichi; and Teranishi, Katsuya, B 475,801.
Sato, Seishiro; Furuya, Toshihiro; and Saito, Yasushi, B 569,293.

Hoffmann, Herwig: *See—*
Pistor, Hans Joachim; Hoffmann, Herwig; Joschek, Hans-Ingo; and Wenner, Gotthilf, B 518,076.

Hoover Ball and Bearing Company: *See—*
Doerr, Wendell P.; and Janko, George F., B 597,410.

Houle, James F.: *See—*
Babbitt, John M.; and Houle, James F., B 501,379.

Ichimaru, Tadashi: *See—*
Takeya, Kenji; Suzuki, Hiroshi; and Ichimaru, Tadashi, B 487,529.

Imperial Chemical Industries Limited: *See—*
Harvey, Edwin Dennis; Fawkes, David Melville; Lemin, Denis Ronald; and Hawkes, James Anthony, B 389,155.

International Paper Company: *See—*
Granberg, Frederick M., B 468,421.

Iqbal, Abul F. M.: *See—*
Sulzbach, Reinhard A.; and Iqbal, Abul F. M., B 461,685.

J. M. Huber Corporation: *See—*
Wason, Satish K., B 564,255.

Janko, George F.: *See—*
Doerr, Wendell P.; and Janko, George F., B 597,410.

Janowiecki, Richard J.; Willson, Michael C.; and Harris, Douglas H., to Monsanto Research Corporation. Plasma spraying process for preparing polycrystalline solar cells. B 561,405, Cl. 148-174.000.

John Wyeth & Brother Limited: *See—*
White, Alan Chapman; and Black, Robin Michael, B 490,812.

Joschek, Hans-Ingo: *See—*
Pistor, Hans Joachim; Hoffmann, Herwig; Joschek, Hans-Ingo; and Wenner, Gotthilf, B 518,076.

Kawar, Faisal T. Process for encapsulating particles by in-situ formation of a metal carbonate coating. B 141,968, Cl. 71-28.000.

Kawasaki, Hideo: *See—*
Ueno, Eichiro; Kawasaki, Hideo; and Shigita, Shozo, B 424,410.

Kawauchi, Kazuhiko: *See—*
Mitsui, Nobuo; Watanabe, Akinori; Oohira, Takeshi; Kawauchi, Kazuhiko; Nakao, Shoichi; and Teranishi, Katsuya, B 475,801.

Kellenbenz, Rolf: *See—*
Waller, Eugen; Buchler, Wolfram; Kellenbenz, Rolf; Schneider, Franz; and Schumann, Burkhard, B 561,166.

Kiener, Volker: *See—*
Adolphi, Heinrich; Wunsch, Gerd; and Kiener, Volker, B 484,437.

Kim, Myung Ki; and Lugay, Joaquin Castro, to General Foods Corporation. Fibrous protein materials. B 480,987, Cl. 426-656.000.

Klein, Gunter Peter: *See—*
Rajakovics, Gundolf; Gabernig, Heinz; and Klein, Gunter Peter, B 328,065.

Knoll, Heinz W.: *See—*
Breitschwerdt, Werner; and Knoll, Heinz W., B 363,565.

Koppers Company, Incl: *See—*
Stutz, Robert E., B 848,336.

Koppers Company, Inc.: *See—*
Corson, Ben B.; and Gormley, William T., B 392,798.

Korber, Hans-Joachim: *See—*
Stettes, Karl-Friedrich; and Korber, Hans-Joachim, B 555,456.

Kotzsch, Hans J.: *See—*
Vahlensieck, Hans J.; Kotzsch, Hans J.; and Seiler, Claus D., B 412,830.

Kuerten, Heribert; Nagel, Otto; Sinn, Richard; Weinle, Werner; and Engler, Peter, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Process for the manufacture of fibrids of thermoplastics materials. B 335,783, Cl. 264-11.000.

Kuligowski, Gerd; and Von Hessberg, Konrad, to Siemens Aktiengesellschaft. Apparatus for recording variable measurement quantities that can be translated into electrical current or voltage variations. B 545,344, Cl. 346-35.000.

L. Schuler GmbH: *See—*
Schneider, Franz; and Schumann, Burkhard, B 561,165.
Waller, Eugen; Buchler, Wolfram; Kellenbenz, Rolf; Schneider, Franz; and Schumann, Burkhard, B 561,166.

Lemin, Denis Ronald: *See—*
Harvey, Edwin Dennis; Fawkes, David Melville; Lemin, Denis Ronald; and Hawkes, James Anthony, B 389,155.

Lenz, Hans: *See—*
Muschelknautz, Edgar; Lenz, Hans; and Herold, Heiko, B 487,078.

Levenson, Harold S.: *See—*
Zeitlin, Benjamin Raphael; Pritchard, Alan Bryan; and Levenson, Harold S., B 431,797.

Lewis, William Dein, to Du Pont de Nemours, E. I., and Company. Oil filter adapter. B 449,988, Cl. 210-199.000.

Lewis, William Dein: *See—*
Cohen, Lester Samuel; and Lewis, William Dein, B 449,989.

Lind, Kurt Bertil Reinhold, to Telefonaktiebolaget L M Ericsson. Synchronization method for the recovery of binary signals. B 478,234, Cl. 325-38.00A.

Lindberg, Carl E., to Continental Oil Company. Tubing connector. B 510,278, Cl. 403-341.000.

Lugay, Joaquin Castro: *See—*
Kim, Myung Ki; and Lugay, Joaquin Castro, B 480,987.

Marathon Oil Company: *See—*
Merrill, LaVaun S., Jr., B 499,370.
Plummer, Mark A.; Schroeder, Donald E., Jr.; and Roszelle, Wayne O., B 562,519.

Marcantonio, Gabriel, to Microsystems International Limited. Method of making thin film crossover structure. B 231,416, Cl. 204-192.000.

Martin, Elmore Louis, to Du Pont de Nemours, E. I., and Company. 2,5-Diisopropylterephthalonitrile. B 573,991, Cl. 260-465.00H.

Martin, Henry E.: *See—*
Games, John E.; Martin, Henry E.; and Walworth, Kirk S., B 270,351.

Matsushita Electric Industrial Company, Limited: *See—*
Dohi, Takashi; Ohara, Kenichi; and Gotoh, Iwao, B 452,915.

Mattern, Alfred, to Siemens Aktiengesellschaft. Method of operating a PCM time-division multiplex telecommunication network. B 497,293, Cl. 179-15.0BA.

Mayled, Edward. Container and closure. B 536,923, Cl. 206-1.500.

Mead Corporation, The: *See—*
Sanders, Frederick W., B 481,778.

Merkle, Hans Rupert; and Siegel, Hardo, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Preparation of 2,5-dimethylfuran-3-carboxylic amides. B 359,768, Cl. 260-347.300.

Merrill, LaVaun S., Jr., to Marathon Oil Company. Method for making and slurrying wax beads. B 499,370, Cl. 208-93.000.

Microsystems International Limited: *See—*
Marcantonio, Gabriel, B 231,416.

Minnesota Mining & Manufacturing Company: *See—*
de Neui, Ricahrd P., B 288,757.
Pavlik, Frank J.; and Hansen, Robert L., B 464,491.

Minolta Camera Kabushiki Kaisha: *See—*
Doi, Yasuhiko; Yamamoto, Shunji; Okada, Osamu; Hikosaka, Takashi; and Hayashi, Masamichi, B 500,171.

Mitchell, William Eric, to Dunlop Limited. Pneumatic tire and wheel rim assemblies. B 522,537, Cl. 152-379.00S.

Mitsui, Nobuo; Watanabe, Akinori; Oohira, Takeshi; Kawauchi, Kazuhiko; Nakao, Shoichi; and Teranishi, Katsuya, to Hitachi, Ltd. Driving system for moving paths or escalators. B 475,801, Cl. 318-98.000.

Mobil Oil Corporation: *See—*
Schwartz, Robert I.; and Sheets, Harry R., B 535,268.

Monsanto Company: *See—*
Sulzbach, Reinhard A.; and Iqbal, Abul F. M., B 461,685.
Wildi, Bernard S.; and Weeks, Lloyd E., B 430,213.

Monsanto Research Corporation: *See—*
Janowiecki, Richard J.; Willson, Michael C.; and Harris, Douglas H., B 561,405.

Motorola, Inc.: *See—*
Roehrman, Kenneth Earl; and van Pul, Bernardus I. C. F., B 477,892.

Muschelknautz, Edgar; Lenz, Hans; and Herold, Heiko, to Bayer Aktiengesellschaft. False-twisting arrangement for synthetic yarns. B 487,078, Cl. 57-77.400.

Nagel, Otto: *See—*
Kuerten, Heribert; Nagel, Otto; Sinn, Richard; Weinle, Werner; and Engler, Peter, B 335,783.

Nakao, Shoichi: *See—*
Mitsui, Nobuo; Watanabe, Akinori; Oohira, Takeshi; Kawauchi, Kazuhiko; Nakao, Shoichi; and Teranishi, Katsuya, B 475,801.

Nestor, David William: *See—*
Douglas, Ellwood S.; Doyle, Richard C.; Nestor, David William; and Wahlgren, Wallace W., B 340,170.

Newcomb, Robert K.: *See—*
Staats, Henry N.; and Newcomb, Robert K., B 576,385.

Offermann, Richard A.; and Vorrier, Robert J., to Union Carbide Corporation. Polyethylene packaging film. B 463,591, Cl. 428-523.000.

Ohara, Kenichi: *See—*
Dohi, Takashi; Ohara, Kenichi; and Gotoh, Iwao, B 452,915.

Okada, Osamu: *See—*
Doi, Yasuhiko; Yamamoto, Shunji; Okada, Osamu; Hikosaka, Takashi; and Hayashi, Masamichi, B 500,171.

Oohira, Takeshi: *See—*
Mitsui, Nobuo; Watanabe, Akinori; Oohira, Takeshi; Kawauchi, Kazuhiko; Nakao, Shoichi; and Teranishi, Katsuya, B 475,801.

Owens-Corning Fiberglas Corporation: *See—*
Fargo, Harland E., B 452,293.
Gilbu, Agnar, B 530,263.
Patterson, John L., B 492,373.

Pabst, Horst: *See—*
Brinkmann, Hans; Eisele, Gottfried; Gormar, Helmut; Pabst, Horst; Putz, Helmut; Schrick, Hans Jurgen; and Sommermeyer, Uwe, B 579,153.

Pace, Gerald F.: *See—*
Stauter, John C.; and Pace, Gerald F., B 369,379.

Patterson, John L., to Owens-Corning Fiberglas Corporation. Method and apparatus for handling linear elements. B 492,373, Cl. 242-36.000.

Pavlik, Frank J.; and Hansen, Robert L., to Minnesota Mining and Manufacturing Company. Film-forming polymer modified with a fluoroaliphatic radical containing compound and hair styling composition thereof. B 464,491, Cl. 132-7.000.

Pistor, Hans Joachim; Hoffmann, Herwig; Joschek, Hans-Ingo; and Wenner, Gotthilf, to BASF Aktiengesellschaft. Manufacture of 4,4'-diphenylmethane diisocyanate and a mixture of diisocyanates and polyisocyanates. B 518,076, Cl. 260-453.0PH.

Plattner, Eric; and Comninellis, Christos, to Ciba-Geigy- Corporation. Process for the manufacture of sulphonic acid fluorides. B 504,582, Cl. 260-543.00F.

Plummer, Mark A.; Schroeder, Donald E., Jr.; and Roszelle, Wayne O., to Marathon Oil Company. Flooding with micellar dispersions containing petroleum sulfonates obtained by sulfonating whole or topped crude oil. B 562,519, Cl. 166-273.000.

Pritchard, Alan Bryan: *See—*
Zeitlin, Benjamin Raphael; Pritchard, Alan Bryan; and Levenson, Harold S., B 431,797.

Putz, Helmut: *See—*
Brinkmann, Hans; Eisele, Gottfried; Gormar, Helmut; Pabst, Horst; Putz, Helmut; Schrick, Hans Jurgen; and Sommermeyer, Uwe, B 579,153.

Rajakovics, Gundolf; Gabernig, Heinz; and Klein, Gunter Peter, to Vereinigte Edelstahlwerke AG., formerly Gebr. Boehler & Co. AG. Process and arrangement for vaporizing of liquids. B 328,065, Cl. 202-185.00A.

Ray, George C., to General Foods Corporation. Induction sealed closure. B 337,023, Cl. 215-347.000.

Reardanz, Eugene H.; and Boudreau, Jerry N., to General Foods Corporation. Intermediate moisture animal food having identifiable meat and egg components. B 441,789, Cl. 426-332.000.

Reed, David F., to Borg-Warner Corporation. Vehicle speed control. B 511,907, Cl. 180-108.000.

Revertex Ltd.: *See—*
Bondy, Clemens, B 358,260.

Reynolds, Edward B., to Continental Oil Company. Method of predicting geothermal gradients in wells. B 513,791, Cl. 73-154.000.

Risgin, Ojars; and Arnold, Charles B., to Sensors, Inc. Gas analyzing. B 374,553, Cl. 250-345.000.

Rockwell International Corporation: *See—*
Henrie, James O., B 510,682.

Roehrman, Kenneth Earl; and van Pul, Bernardus I. C. F., to Motorola, Inc. Semiconductor wafer having machine readable indicies. B 477,892, Cl. 235-61.11E.

Roszelle, Wayne O.: *See—*
Plummer, Mark A.; Schroeder, Donald E., Jr.; and Roszelle, Wayne O., B 562,519.

Rottger, Hans: *See—*
Berger, Wolfgang; and Rottger, Hans, B 488,836.

Rucker Company, The: *See—*
Douglas, Ellwood S.; Doyle, Richard C.; Nestor, David William; and Wahlgren, Wallace W., B 340,170.

Saito, Yasushi: *See—*
Sato, Seishiro; Furuya, Toshihiro; and Saito, Yasushi, B 569,293.

Sanders, Frederick W., to Mead Corporation, The. Sulfur recovery system. B 481,778, Cl. 423-573.00G.

Sasaki, Masanobu, to Sony Corporation. Fade-in and fade-out switching circuit. B 503,371, Cl. 307-251.000.

Sato, Seishiro; Furuya, Toshihiro; and Saito, Yasushi, to Hitachi, Ltd. Apparatus for displaying image produced by electrically charged particle beam. B 569,293, Cl. 250-397.000.

Sause, H. William: *See—*
Adelstein, Gilbert W.; and Sause, H. William, B 568,405.

Schaupp, Kurt: *See—*
Hinsche, Friedrich; and Schaupp, Kurt, B 459,821.

Schexnayder, Lawrence Francis, to Caterpillar Tractor Co. Air pressure modulated brake valve system. B 545,856, Cl. 303-71.000.

Schneider, Franz; and Schumann, Burkhard, to L. Schuler GmbH. Process and apparatus for actuating the ram weight compensation mechanism of a press. B 561,165, Cl. 100-35.000.

Schneider, Franz: *See—*
Waller, Eugen; Buchler, Wolfram; Kellenbenz, Rolf; Schneider, Franz; and Schumann, Burkhard, B 561,166.

Scholl, Charles H.: *See—*
Brenner, Lawrence A.; and Scholl, Charles H., B 452,944.

Schranz, Karl-Wilhelm: *See—*
Bergthaller, Peter; Himmelmann, Wolfgang; and Schranz, Karl-Wilhelm, B 481,190.

Schreiner, Horst; and Friedrich, Dieter, to Siemens Aktiengesellschaft. Hot-tinned wire for electrotechnical purposes and method for its production. B 519,680, Cl. 29-183.500.

Schrick, Hans Jurgen: *See—*
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CLASSIFICATION OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM

DATE PUBLISHED MARCH 30, 1976

NOTE.—First number, class; second number, subclass; third number, document number

		CAT.	PUB. DATE
Class 8			
1E	B 407,205	C	Mar. 16, 1976
10.2	B 430,334	C	Jan. 27, 1976
14	B 460,388	C	Jan. 27, 1976
	B 497,473	C	Feb. 3, 1976
17	B 458,060	C	Jan. 13, 1976
21A	B 424,410	C	Mar. 30, 1976
62	B 507,476	C	Feb. 10, 1976
74	B 354,959	C	Feb. 17, 1976
84	B 495,903	C	Feb. 17, 1976
94.24	B 520,995	C	Mar. 23, 1976
115.5	B 372,232	C	Mar. 16, 1976
115.7	B 389,304	C	Jan. 27, 1976
142	B 423,867	C	Feb. 3, 1976
161	B 461,352	C	Jan. 13, 1976
169	B 497,571	C	Mar. 23, 1976
173	B 537,058	C	Mar. 23, 1976
174	B 344,967	C	Feb. 3, 1976
178R	B 389,155	C	Mar. 30, 1976
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147A	B 502,667	M	Feb. 24, 1976
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256.53	B 579,116	M	Feb. 3, 1976
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125	B 589,687	M	Mar. 23, 1976
128R	B 594,871	M	Mar. 16, 1976
129	B 565,754	M	Mar. 30, 1976
Class 17			
23	B 519,599	M	Feb. 17, 1976
2502	B 541,496	E	Jan. 27, 1976
Class 19			
155	B 569,501	M	Mar. 9, 1976
Class 21			
2.7R	B 527,999	C	Feb. 3, 1976
Class 23			
230B	B 554,039	C	Feb. 24, 1976
273SP	B 431,785	C	Feb. 24, 1976
273V	B 563,165	C	Mar. 9, 1976
277R	B 510,682	C	Mar. 30, 1976
285F	B 565,180	C	Jan. 27, 1976
Class 24			
75	B 532,476	M	Feb. 3, 1976
Class 28			
1.6	B 497,292	M	Feb. 3, 1976
Class 29			
96	B 546,911	M	Jan. 13, 1976
127	B 510,855	M	Jan. 27, 1976
180SS	B 421,975	C	Mar. 2, 1976
183.5	B 519,680	C	Mar. 30, 1976
237	B 503,436	M	Feb. 24, 1976
415	B 504,061	M	Mar. 16, 1976
428	B 520,928	M	Jan. 13, 1976
578	B 561,732	M	Feb. 3, 1976
580	B 492,301	M	Jan. 13, 1976
Class 30			
133	B 581,843	M	Mar. 16, 1976
Class 32			
10A	B 491,501	M	Jan. 13, 1976
Class 33			
143F	B 540,888	M	Mar. 30, 1976
174S	B 498,820	M	Mar. 9, 1976
Class 35			
17	B 546,097	M	Mar. 23, 1976
36	B 511,454	M	Feb. 24, 1976
Class 37			
8	B 558,819	M	Feb. 3, 1976
57	B 531,753	M	Mar. 2, 1976
142A	B 511,099	M	Feb. 3, 1976
Class 40			
28C	B 493,981	M	Mar. 9, 1976
159	B 456,153	M	Mar. 9, 1976
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2	B 496,792	C	Feb. 17, 1976
62	B 407,812	C	Mar. 23, 1976
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1.7	B 491,776	M	Mar. 16, 1976
57.6	B 548,028	M	Feb. 3, 1976
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73	B 541,376	C	Feb. 17, 1976
192	B 593,781	C	Mar. 16, 1976
358	B 576,859	M	Feb. 24, 1976
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358	B 576,859	M	Feb. 24, 1976
Class 52			
207	B 459,597	M	Feb. 17, 1976
225	B 591,615	M	Mar. 30, 1976
484	B 522,354	M	Jan. 20, 1976
Class 53			
77	B 508,878	M	Feb. 3, 1976
Class 55			
70	B 456,905	C	Mar. 23, 1976
71	B 570,925	C	Mar. 23, 1976
105	B 490,806	C	Feb. 3, 1976
352	B 543,941	C	Jan. 13, 1976
417	B 502,151	C	Mar. 23, 1976
Class 56			
13.4	B 494,167	M	Mar. 23, 1976
14.5	B 549,244	M	Jan. 27, 1976
15.9	B 558,973	M	Feb. 10, 1976
Class 57			
77.4	B 487,078	M	Mar. 30, 1976
140BY	B 495,124	M	Mar. 9, 1976
Class 58			
21.13	B 516,825	M	Feb. 3, 1976
Class 60			
39.63	B 491,774	M	Mar. 30, 1976
226A	B 445,459	M	Feb. 3, 1976
299	B 551,133	M	Mar. 2, 1976
304	B 502,540	M	Jan. 13, 1976
349	B 541,464	M	Feb. 17, 1976
422	B 526,445	M	Jan. 20, 1976
424	B 584,520	M	Jan. 27, 1976
425	B 535,386	M	Jan. 13, 1976
431	B 551,809	M	Feb. 24, 1976
445	B 400,871	M	Feb. 17, 1976
592	B 465,145	M	Jan. 27, 1976
645	B 538,472	M	Feb. 3, 1976
660	B 556,496	M	Mar. 16, 1976
667	B 464,027	M	Mar. 16, 1976
690	B 505,689	M	Mar. 2, 1976
706	B 509,238	M	Feb. 24, 1976
Class 61			
.5	B 554,283	M	Jan. 27, 1976
49	B 504,439	M	Mar. 16, 1976
Class 62			
306	B 522,009	M	Feb. 17, 1976

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3A	B 532,969	C	Jan. 13, 1976
11W	B 557,721	C	Mar. 23, 1976
49	B 517,858	C	Feb. 17, 1976
239	B 545,777	C	Jan. 27, 1976
Class 66			
116	B 438,882	M	Feb. 24, 1976
190	B 522,227	M	Mar. 30, 1976
Class 71			
28	B 141,968	C	Mar. 30, 1976
113	B 535,076	C	Jan. 20, 1976
Class 72			
43	B 546,631	M	Feb. 3, 1976
56	B 489,290	M	Feb. 17, 1976
88	B 575,757	M	Jan. 27, 1976
238	B 563,932	M	Mar. 23, 1976
391	B 516,537	M	Feb. 17, 1976
Class 73			
9	B 573,994	M	Mar. 23, 1976
24	B 506,744	M	Jan. 13, 1976
29	B 557,153	M	Feb. 3, 1976
37.7	B 532,319	M	Feb. 3, 1976
61.1R	B 511,909	M	Feb. 17, 1976
67.5H	B 522,309	M	Feb. 3, 1976
116	B 569,859	M	Mar. 9, 1976
147	B 521,620	M	Jan. 27, 1976
154	B 513,791	M	Mar. 30, 1976
190R	B 480,350	M	Feb. 10, 1976
302	B 463,473	M	Mar. 23, 1976
	B 464,290	M	Feb. 3, 1976
422GC	B 490,547	M	Feb. 24, 1976
432R	B 415,021	M	Mar. 2, 1976
437	B 528,401	M	Feb. 3, 1976
557	B 523,080	M	Feb. 17, 1976
Class 74			
18.2	B 501,975	M	Mar. 2, 1976
242.1A	B 567,854	M	Feb. 3, 1976
243C	B 558,818	M	Jan. 13, 1976
424.8VA	B 499,786	M	Mar. 16, 1976
479	B 509,586	M	Feb. 3, 1976
481	B 497,021	M	Jan. 13, 1976
482	B 525,809	M	Feb. 24, 1976
527	B 470,170	M	Jan. 13, 1976
546	B 518,999	M	Feb. 3, 1976
765	B 500,945	M	Feb. 24, 1976
Class 75			
.5BA	B 385,631	C	Jan. 27, 1976
84.1R	B 538,491	C	Feb. 17, 1976
101BE	B 452,938	C	Feb. 17, 1976
135	B 525,961	C	Jan. 13, 1976
156.5	B 411,471	C	Feb. 17, 1976
165	B 483,256	C	Feb. 10, 1976
Class 83			
61	B 570,862	M	Feb. 24, 1976
425	B 545,935	M	Jan. 27, 1976
Class 84			
1.1	B 476,568	E	Mar. 16, 1976
1.16	B 556,897	M	Feb. 3, 1976
275	B 504,169	M	Jan. 13, 1976
Class 86			
1R	B 356,187	M	Jan. 20, 1976
Class 89			
142	B 470,853	M	Mar. 23, 1976
Class 91			
40	B 410,694	M	Mar. 23, 1976
Class 92			
163	B 425,193	M	Mar. 23, 1976
Class 93			
58.3	B 548,978	M	Mar. 9, 1976
Class 96			
1R	B 423,883	C	Jan. 27, 1976
1.4	B 200,759	C	Feb. 3, 1976
33	B 437,894	C	Mar. 2, 1976
35	B 524,026	C	Feb. 10, 1976
35.1	B 420,176	C	Mar. 16, 1976
	B 462,893	C	Feb. 24, 1976
	B 530,873	C	Feb. 17, 1976
36.1	B 359,901	C	Jan. 13, 1976
45	B 455,759	C	Feb. 24, 1976
50PT	B 481,190	E	Mar. 30, 1976
54	B 367,305	C	Mar. 2, 1976
66.3	B 417,498	C	Mar. 23, 1976
78	B 503,029	C	Jan. 27, 1976
Class 99			
162B	B 432,991	M	Mar. 2, 1976
335	B 557,299	M	Feb. 3, 1976
485	B 311,450	M	Mar. 9, 1976
Class 100			
35	B 561,165	M	Mar. 30, 1976
48	B 561,166	M	Mar. 30, 1976
Class 101			
93.13	B 496,999	M	Jan. 27, 1976
93.14	B 481,600	M	Jan. 27, 1976
115	B 395,554	M	Mar. 9, 1976
129	B 416,589	M	Jan. 27, 1976
401.3	B 494,234	M	Feb. 10, 1976
Class 102			
32	B 405,726	M	Jan. 13, 1976
38	B 279,415	M	Mar. 16, 1976
39	B 417,349	M	Mar. 9, 1976
42R	B 443,163	M	Feb. 3, 1976
69	B 412,068	M	Jan. 13, 1976
Class 106			
1	B 466,419	C	Mar. 23, 1976
27	B 452,883	C	Jan. 27, 1976
47R	B 581,564	C	Mar. 23, 1976
57	B 502,773	C	Jan. 13, 1976
58	B 480,287	C	Mar. 30, 1976
	B 750,679	C	Mar. 23, 1976
213	B 432,265	C	Mar. 23, 1976
288	B 564,255	C	Mar. 30, 1976
309	B 311,779	C	Feb. 10, 1976
316	B 503,776	C	Mar. 23, 1976
Class 109			
1SB	B 358,427	E	Feb. 3, 1976
Class 110			
8R	B 512,324	M	Feb. 17, 1976
Class 114			
16.6	B 546,922	M	Mar. 16, 1976
67A	B 489,550	M	Mar. 16, 1976
144R	B 529,659	M	Feb. 24, 1976
230	B 484,769	M	Mar. 16, 1976
	B 503,456	M	Mar. 23, 1976
Class 116			
124L	B 469,228	M	Feb. 17, 1976
124.4	B 467,412	M	Jan. 13, 1976
Class 118			
637	B 563,301	M	Feb. 17, 1976
Class 123			
8.45	B 570,172	M	Feb. 3, 1976
25R	B 447,440	M	Feb. 17, 1976
32SP	B 467,486	M	Mar. 16, 1976
75B	B 563,780	M	Feb. 3, 1976
119A	B 405,899	M	Mar. 23, 1976
122AC	B 498,951	M	Mar. 2, 1976
139AW	B 480,251	M	Mar. 23, 1976
148E	B 480,473	M	Mar. 2, 1976
182	B 558,251	M	Jan. 13, 1976
191S	B 466,906	M	Mar. 16, 1976
325T	B 425,588	M	Jan. 13, 1976
Class 126			
271	B 512,745	M	Jan. 13, 1976
350A	B 537,903	M	Jan. 20, 1976
Class 128			
2.6R	B 534,574	M	Feb. 24, 1976
260	B 520,277	M	Feb. 17, 1976
	B 524,121	M	Feb. 3, 1976
419P	B 535,466	M	Jan. 27, 1976
419PG	B 533,259	M	Feb. 24, 1976
Class 131			
144	B 586,387	M	Feb. 3, 1976
514.4	B 586,380	M	Mar. 2, 1976

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7	B 464,491	M	Mar. 30, 1976
Class 136			
26	B 511,665	C	Mar. 2, 1976
86R	B 505,126	C	Feb. 10, 1976
	B 574,128	C	Feb. 17, 1976
89	B 510,677	C	Feb. 24, 1976
148	B 524,464	C	Feb. 10, 1976
202	B 378,513	C	Jan. 27, 1976
205	B 399,632	C	Mar. 9, 1976
Class 137			
220	B 554,833	M	Mar. 30, 1976
255	B 508,940	M	Feb. 17, 1976
596.12	B 514,687	M	Jan. 27, 1976
608	B 490,623	M	Mar. 2, 1976
614.11	B 530,605	M	Feb. 3, 1976
625.46	B 528,756	M	Feb. 3, 1976
627.5	B 432,594	M	Mar. 30, 1976
798	B 430,172	M	Jan. 13, 1976
Class 138			
177	B 530,263	C	Mar. 30, 1976
Class 139			
122R	B 527,171	M	Mar. 9, 1976
Class 140			
92.1	B 590,158	M	Feb. 10, 1976
	B 590,159	M	Feb. 3, 1976
Class 141			
294	B 473,813	M	Mar. 9, 1976
Class 144			
32R	B 484,332	M	Mar. 2, 1976
34R	B 521,793	M	Feb. 24, 1976
241	B 545,630	M	Jan. 27, 1976
Class 148			
1.5	B 518,226	C	Feb. 10, 1976
23	B 527,972	C	Mar. 9, 1976
36	B 459,381	C	Mar. 9, 1976
174	B 561,405	C	Mar. 30, 1976
175	B 105,006	C	Mar. 23, 1976
187	B 554,164	C	Mar. 9, 1976
Class 150			
3	B 461,250	M	Mar. 16, 1976
8	B 459,190	M	Mar. 30, 1976
52R	B 513,134	M	Mar. 23, 1976
Class 152			
213R	B 445,690	M	Feb. 3, 1976
379S	B 522,537	M	Mar. 30, 1976
Class 156			
3	B 453,031	C	Mar. 16, 1976
	B 563,722	C	Jan. 13, 1976
66	B 497,584	C	Feb. 24, 1976
71	B 456,148	C	Jan. 13, 1976
73.6	B 414,481	C	Jan. 20, 1976
143	B 462,386	C	Jan. 13, 1976
159	B 339,446	C	Feb. 24, 1976
167	B 452,293	C	Mar. 30, 1976
220	B 480,591	C	Mar. 30, 1976
435	B 475,385	C	Mar. 9, 1976
461	B 288,757	C	Mar. 30, 1976
608	B 584,997	C	Mar. 9, 1976
Class 160			
229R	B 505,813	M	Jan. 13, 1976
Class 162			
5	B 491,673	C	Feb. 17, 1976
133	B 431,072	C	Jan. 20, 1976
198	B 150,142	C	Jan. 27, 1976
	B 552,629	C	Mar. 23, 1976
274	B 468,421	C	Mar. 30, 1976
290	B 478,739	C	Feb. 17, 1976
Class 164			
26	B 499,227	M	Jan. 27, 1976
57	B 488,756	M	Mar. 16, 1976
60	B 511,885	M	Jan. 27, 1976
282	B 396,916	M	Mar. 2, 1976
330	B 522,038	M	Feb. 3, 1976
Class 165			
4	B 328,116	M	Mar. 9, 1976
13	B 543,078	M	Feb. 17, 1976
32	B 529,194	C	Mar. 23, 1976
162	B 488,836	M	Mar. 30, 1976
Class 166			
224	B 492,120	M	Feb. 24, 1976
272	B 569,519	M	Feb. 3, 1976
273	B 562,519	M	Mar. 30, 1976
303	B 529,836	M	Feb. 3, 1976
311	B 511,156	M	Jan. 27, 1976
Class 172			
719	B 97,259	M	Mar. 9, 1976
Class 173			
104	B 537,709	M	Jan. 13, 1976
170	B 567,058	M	Jan. 13, 1976
Class 174			
52R	B 492,902	E	Feb. 24, 1976
68.5	B 509,772	E	Mar. 16, 1976
Class 176			
20R	B 384,330	C	Jan. 27, 1976
36R	B 367,621	C	Feb. 3, 1976
68	B 396,164	C	Feb. 3, 1976
Class 178			
6	B 520,227	E	Mar. 30, 1976
	B 546,426	E	Jan. 27, 1976
7.1	B 468,100	E	Mar. 9, 1976
	B 519,979	E	Feb. 3, 1976
7.3D	B 442,970	E	Feb. 3, 1976
7.3DC	B 561,770	E	Mar. 16, 1976
7.5R	B 508,817	E	Feb. 3, 1976
58R	B 399,908	C	Jan. 13, 1976
66R	B 498,775	E	Mar. 2, 1976
70R	B 559,631	E	Mar. 23, 1976
88	B 561,764	E	Jan. 27, 1976
Class 179			
1A	B 513,756	E	Feb. 3, 1976
1CN	B 475,681	E	Jan. 20, 1976
1SM	B 476,577	E	Jan. 20, 1976
1G	B 554,594	E	Jan. 20, 1976
1.5FS	B 504,899	E	Mar. 9, 1976
2DP	B 462,030	E	Mar. 23, 1976
7.1R	B 545,050	E	Jan. 20, 1976
15AL	B 496,500	E	Feb. 3, 1976
15BA	B 497,293	E	Mar. 30, 1976
81R	B 472,284	E	Jan. 13, 1976
90K	B 432,049	E	Mar. 23, 1976
111E	B 557,274	E	Mar. 23, 1976
170D	B 541,415	E	Feb. 3, 1976
Class 180			
5R	B 499,171	M	Jan. 27, 1976
44F	B 432,969	M	Mar. 2, 1976
49	B 433,094	M	Jan. 27, 1976
53R	B 551,527	M	Jan. 13, 1976
79.2R	B 533,968	M	Jan. 27, 1976
103	B 490,647	M	Feb. 24, 1976
108	B 511,907	M	Mar. 30, 1976
Class 187			
1R	B 436,724	M	Feb. 24, 1976
Class 188			
71.1	B 535,411	M	Feb. 24, 1976
73.6	B 533,056	M	Jan. 13, 1976
165	B 567,435	M	Feb. 3, 1976
218XL	B 562,698	M	Jan. 13, 1976
Class 192			
3.57	B 548,719	M	Feb. 17, 1976
4A	B 531,267	M	Feb. 24, 1976
46	B 522,080	M	Mar. 16, 1976
Class 195			
1.8	B 530,255	E	Mar. 2, 1976
	B 514,839	C	Mar. 2, 1976
29	B 418,489	C	Jan. 13, 1976
31R	B 493,463	C	Mar. 23, 1976
65	B 566,585	C	Mar. 2, 1976
	B 592,146	C	Mar. 2, 1976
68	B 395,975	C	Mar. 2, 1976
	B 430,213	C	Mar. 30, 1976
80R	B 527,040	C	Mar. 23, 1976
103.5R	B 452,879	C	Mar. 16, 1976
Class 196			
14.52	B 520,384	M	Jan. 27, 1976
Class 197			
17	B 501,122	M	Feb. 17, 1976

NOTE.—First number, class; second number, subclass; third number, document number

		CAT.	PUB. DATE
18	B 535,391	M	Jan. 27, 1976
Class 198			
25	B 452,944	M	Mar. 30, 1976
38	B 495,402	M	Feb. 17, 1976
129	B 503,521	M	Mar. 16, 1976
	B 569,646	M	Jan. 13, 1976
179	B 424,989	M	Feb. 3, 1976
202	B 499,352	M	Jan. 27, 1976
Class 200			
5R	B 579,104	E	Jan. 27, 1976
11TC	B 531,425	E	Feb. 3, 1976
16C	B 480,740	E	Mar. 2, 1976
38FA	B 494,383	E	Feb. 3, 1976
61.41	B 506,286	E	Jan. 20, 1976
67D	B 585,247	E	Feb. 3, 1976
83SA	B 428,877	E	Jan. 27, 1976
84C	B 453,533	E	Feb. 17, 1976
309	B 470,899	E	Mar. 2, 1976
339	B 466,390	E	Feb. 24, 1976
Class 202			
185A	B 328,065	C	Mar. 30, 1976
227	B 513,280	C	Jan. 20, 1976
Class 203			
59	B 466,304	C	Mar. 23, 1976
73	B 441,543	C	Mar. 23, 1976
Class 204			
9	B 462,424	C	Feb. 24, 1976
15	B 542,135	C	Feb. 10, 1976
158HA	B 550,744	C	Feb. 17, 1976
159.16	B 476,776	C	Mar. 23, 1976
159.18	B 498,205	C	Feb. 10, 1976
159.22	B 423,404	C	Mar. 2, 1976
162R	B 354,222	C	Mar. 23, 1976
163R	B 526,447	C	Feb. 24, 1976
181	B 167,470	C	Mar. 2, 1976
186	B 589,179	C	Mar. 23, 1976
192	B 231,416	C	Mar. 30, 1976
195P	B 511,002	C	Mar. 2, 1976
195S	B 843,038	C	Feb. 3, 1976
224M	B 534,314	C	Feb. 10, 1976
252	B 542,258	C	Mar. 23, 1976
Class 206			
1.5	B 536,923	M	Mar. 30, 1976
451	B 371,912	M	Mar. 2, 1976
455	B 490,067	M	Jan. 27, 1976
Class 208			
15	B 437,596	C	Jan. 27, 1976
33	B 516,625	C	Mar. 30, 1976
59	B 508,118	C	Feb. 17, 1976
78	B 467,250	C	Feb. 3, 1976
93	B 499,370	C	Mar. 30, 1976
208R	B 508,119	C	Feb. 17, 1976
210	B 501,317	C	Jan. 13, 1976
253	B 438,916	C	Jan. 13, 1976
323	B 476,542	C	Mar. 30, 1976
Class 210			
22R	B 525,204	C	Mar. 16, 1976
23H	B 364,797	C	Feb. 17, 1976
	B 524,806	C	Mar. 2, 1976
24	B 452,501	C	Mar. 16, 1976
84	B 356,470	C	Mar. 23, 1976
130	B 532,901	C	Jan. 13, 1976
168	B 449,989	C	Mar. 30, 1976
189	B 492,716	C	Mar. 2, 1976
199	B 449,988	C	Mar. 30, 1976
321A	B 470,601	C	Mar. 9, 1976
500M	B 433,930	C	Mar. 23, 1976
	B 493,474	C	Mar. 23, 1976
512R	B 330,719	C	Mar. 16, 1976
Class 214			
1C	B 453,238	M	Mar. 2, 1976
18N	B 373,344	M	Feb. 3, 1976
58	B 555,772	M	Jan. 13, 1976
90R	B 536,403	M	Mar. 23, 1976
152	B 480,604	M	Jan. 13, 1976
Class 215			
216	B 541,015	M	Jan. 27, 1976
347	B 337,023	M	Mar. 30, 1976
Class 219			
69M	B 426,227	E	Mar. 2, 1976
121EM	B 479,502	E	Mar. 16, 1976
201	B 451,248	E	Mar. 2, 1976
233	B 463,388	E	Feb. 10, 1976
273	B 403,507	E	Feb. 10, 1976
553	B 513,027	E	Feb. 17, 1976
Class 220			
23.83	B 529,156	M	Jan. 13, 1976
66	B 223,678	M	Mar. 9, 1976
288	B 516,032	M	Jan. 27, 1976
337	B 578,447	M	Jan. 20, 1976
Class 221			
75	B 510,281	M	Mar. 9, 1976
Class 222			
43	B 497,853	M	Feb. 17, 1976
56	B 559,697	M	Mar. 16, 1976
67	B 521,480	M	Jan. 13, 1976
136	B 487,260	M	Jan. 27, 1976
181	B 562,601	M	Mar. 16, 1976
306	B 559,954	M	Feb. 3, 1976
325	B 515,303	M	Jan. 20, 1976
512	B 532,976	M	Mar. 23, 1976
Class 226			
1	B 506,624	M	Mar. 9, 1976
21	B 504,778	M	Feb. 24, 1976
68	B 506,926	M	Feb. 17, 1976
Class 228			
190	B 473,972	M	Jan. 13, 1976
Class 229			
2.5	B 537,990	M	Jan. 13, 1976
17R	B 461,257	M	Jan. 13, 1976
62.5	B 429,157	M	Jan. 27, 1976
Class 235			
61.11E	B 477,892	E	Mar. 30, 1976
151	B 491,650	E	Mar. 9, 1976
151.1	B 520,063	E	Mar. 2, 1976
	B 520,075	E	Feb. 24, 1976
	B 520,076	E	Mar. 2, 1976
	B 520,082	E	Mar. 23, 1976
	B 535,268	C	Mar. 30, 1976
151.11	B 540,767	E	Mar. 16, 1976
151.12	B 504,156	E	Mar. 23, 1976
151.34	B 492,946	E	Jan. 27, 1976
152	B 484,121	E	Mar. 16, 1976
	B 559,737	E	Jan. 20, 1976
153AK	B 563,419	E	Mar. 23, 1976
153AM	B 587,936	E	Mar. 23, 1976
154	B 534,016	E	Feb. 3, 1976
156	B 536,009	E	Jan. 27, 1976
175	B 560,488	E	Mar. 16, 1976
181	B 520,924	E	Jan. 27, 1976
Class 236			
13	B 502,652	M	Feb. 24, 1976
15A	B 558,813	M	Feb. 3, 1976
Class 239			
265.39	B 567,592	M	Mar. 16, 1976
424	B 580,921	M	Jan. 13, 1976
	B 586,215	M	Jan. 20, 1976
652	B 520,534	M	Feb. 17, 1976
Class 240			
41.35R	B 454,283	E	Feb. 3, 1976
Class 241			
46.11	B 462,828	M	Mar. 9, 1976
81	B 425,462	M	Mar. 9, 1976
Class 242			
25A	B 420,321	M	Mar. 30, 1976
36	B 492,373	M	Mar. 30, 1976
43R	B 521,600	M	Jan. 27, 1976
56R	B 535,448	M	Mar. 16, 1976
107.4A	B 487,427	M	Mar. 2, 1976
129.8	B 506,167	M	Feb. 10, 1976
Class 244			
3.27	B 510,521	M	Mar. 2, 1976
134R	B 535,928	M	Jan. 13, 1976
140	B 419,173	M	Mar. 9, 1976
169	B 423,441	M	Feb. 17, 1976
	B 511,346	M	Jan. 27, 1976
Class 248			
49	B 398,488	M	Feb. 24, 1976
73	B 494,806	M	Feb. 3, 1976
205R	B 520,952	M	Mar. 16, 1976
309R	B 527,333	M	Mar. 23, 1976

NOTE.—First number, class; second number, subclass; third number, document number

		CAT.	PUB. DATE
Class 249			
135	B 548,155	M	Jan. 13, 1976
Class 250			
210	B 515,908	E	Jan. 20, 1976
227	B 522,577	E	Jan. 27, 1976
	B 560,765	E	Feb. 3, 1976
231SE	B 503,618	E	Mar. 9, 1976
291	B 500,981	E	Jan. 27, 1976
303	B 536,082	E	Mar. 16, 1976
310	B 485,926	E	Mar. 23, 1976
328	B 71,613	E	Mar. 16, 1976
345	B 374,553	E	Mar. 30, 1976
364	B 526,190	E	Feb. 17, 1976
397	B 569,293	E	Mar. 30, 1976
402	B 451,534	E	Jan. 13, 1976
445T	B 574,616	E	Mar. 2, 1976
564	B 566,572	E	Mar. 16, 1976
577	B 507,396	E	Feb. 10, 1976
Class 251			
1B	B 541,710	M	Feb. 24, 1976
28	B 480,384	M	Mar. 23, 1976
58	B 429,434	M	Feb. 17, 1976
129	B 534,333	M	Feb. 17, 1976
319	B 490,589	M	Feb. 3, 1976
Class 252			
12	B 559,142	C	Mar. 2, 1976
12.2	B 380,137	C	Mar. 23, 1976
25	B 468,603	C	Mar. 23, 1976
33.6	B 441,723	C	Mar. 16, 1976
62.1L	B 376,749	E	Mar. 30, 1976
105	B 479,969	C	Mar. 9, 1976
106	B 530,303	C	Mar. 23, 1976
156	B 520,546	C	Mar. 2, 1976
182	B 471,405	C	Feb. 10, 1976
301.1W	B 548,058	C	Feb. 17, 1976
301.2W	B 528,297	C	Mar. 16, 1976
301.4S	B 535,813	C	Jan. 27, 1976
364	B 370,309	C	Jan. 20, 1976
404	B 569,125	C	Feb. 24, 1976
408R	B 544,476	C	Feb. 24, 1976
429R	B 457,850	C	Feb. 10, 1976
432	B 509,640	C	Feb. 17, 1976
454	B 450,967	C	Jan. 13, 1976
455R	B 390,979	C	Mar. 23, 1976
500	B 479,242	C	Feb. 17, 1976
514	B 553,421	C	Mar. 23, 1976
518	B 585,731	C	Feb. 3, 1976
543	B 403,766	C	Feb. 10, 1976
544	B 433,707	C	Mar. 23, 1976
Class 254			
186R	B 511,407	M	Feb. 10, 1976
188	B 437,559	M	Feb. 3, 1976
190R	B 489,685	M	Feb. 24, 1976
Class 259			
4	B 486,614	N	Feb. 17, 1976
8	B 547,016	M	Mar. 23, 1976
191	B 397,674	M	Mar. 16, 1976
	B 556,057	M	Jan. 13, 1976
Class 260			
2.5AC	B 497,194	C	Feb. 3, 1976
	B 537,102	C	Jan. 13, 1976
2.5AJ	B 557,856	C	Feb. 10, 1976
2.5AM	B 422,063	C	Feb. 3, 1976
2.5AR	B 483,606	C	Jan. 27, 1976
	B 502,589	C	Jan. 27, 1976
2.5AV	B 460,441	C	Jan. 13, 1976
2.5AW	B 483,762	C	Feb. 10, 1976
	B 486,828	C	Mar. 2, 1976
2.5B	B 554,380	C	Mar. 9, 1976
2.5R	B 471,579	C	Jan. 13, 1976
17R	B 510,998	C	Feb. 10, 1976
	B 519,487	C	Feb. 17, 1976
17.4ST	B 530,580	C	Mar. 2, 1976
18TN	B 528,303	C	Feb. 10, 1976
23H	B 54,859	C	Feb. 17, 1976
23XA	B 483,865	C	Jan. 13, 1976
28P	B 489,331	C	Feb. 17, 1976
28R	B 507,456	C	Mar. 9, 1976
28.5AS	B 501,540	C	Jan. 13, 1976
29.2EP	B 455,686	C	Mar. 2, 1976
	B 522,629	C	Mar. 16, 1976
	B 526,997	C	Jan. 13, 1976
29.2TN	B 414,266	C	Feb. 10, 1976
29.6F	B 567,076	C	Mar. 23, 1976
29.6N	B 494,440	C	Feb. 17, 1976
29.6TA	B 494,450	C	Feb. 17, 1976
29.7PT	B 358,260	C	Mar. 30, 1976
30.4R	B 485,060	C	Feb. 17, 1976
31.8N	B 592,658	C	Mar. 23, 1976
32.6R	B 596,692	C	Feb. 17, 1976
33.6AQ	B 520,658	C	Mar. 9, 1976
	B 657,438	C	Jan. 20, 1976
33.6R	B 479,175	C	Feb. 17, 1976
33.6UA	B 559,441	C	Mar. 23, 1976
33.8UA	B 497,780	C	Feb. 24, 1976
	B 570,721	C	Mar. 23, 1976
37EP	B 423,365	C	Feb. 17, 1976
	B 441,605	C	Feb. 3, 1976
37R	B 465,955	C	Feb. 3, 1976
40P	B 485,188	C	Mar. 16, 1976
40R	B 590,502	C	Mar. 23, 1976
42.15	B 257,143	C	Mar. 16, 1976
	B 415,122	C	Feb. 10, 1976
42.18	B 519,095	C	Feb. 24, 1976
45.75H	B 487,529	C	Mar. 30, 1976
45.75W	B 561,387	C	Feb. 10, 1976
45.8N	B 506,648	C	Feb. 3, 1976
45.8R	B 479,556	C	Mar. 23, 1976
45.85R	B 236,342	C	Feb. 10, 1976
46.5UA	B 528,962	C	Feb. 24, 1976
	B 528,966	C	Feb. 24, 1976
47EP	B 440,633	C	Feb. 10, 1976
47EQ	B 444,078	C	Mar. 23, 1976
47UP	B 493,537	C	Mar. 23, 1976
63UY	B 470,576	C	Feb. 24, 1976
75N	B 521,125	C	Feb. 10, 1976
	B 521,126	C	Feb. 10, 1976
	B 521,127	C	Feb. 17, 1976
	B 521,128	C	Feb. 10, 1976
	B 552,489	C	Feb. 10, 1976
	B 559,700	C	Mar. 23, 1976
	B 559,701	C	Mar. 23, 1976
75R	B 236,266	C	Mar. 23, 1976
77.5AN	B 474,645	C	Mar. 2, 1976
77.5CR	B 306,668	C	Feb. 3, 1976
78S	B 451,308	C	Feb. 17, 1976
78.5R	B 437,209	C	Feb. 3, 1976
78UA	B 497,490	C	Mar. 23, 1976
79.5P	B 546,149	C	Mar. 2, 1976
80M	B 522,446	C	Mar. 30, 1976
80.73	B 505,221	C	Mar. 30, 1976
80.78	B 271,743	C	Mar. 16, 1976
82.1	B 443,563	C	Feb. 24, 1976
88.2C	B 417,014	C	Jan. 13, 1976
88.2F	B 632,416	C	Mar. 9, 1976
93.5A	B 530,174	C	Feb. 24, 1976
112.5R	B 471,617	C	Feb. 10, 1976
	B 485,972	C	Mar. 23, 1976
	B 503,817	C	Jan. 13, 1976
	B 520,514	C	Mar. 9, 1976
117	B 333,247	C	Mar. 16, 1976
140R	B 503,579	C	Feb. 10, 1976
143	B 419,582	C	Mar. 2, 1976
147	B 383,697	C	Feb. 17, 1976
156	B 411,624	C	Mar. 16, 1976
157	B 591,141	C	Mar. 23, 1976
167	B 444,294	C	Mar. 30, 1976
210AB	B 554,291	C	Mar. 9, 1976
220B	B 326,211	C	Mar. 23, 1976
239A	B 349,370	C	Jan. 27, 1976
239B	B 470,900	C	Mar. 2, 1976
239BC	B 403,326	C	Mar. 23, 1976
239D	B 382,120	C	Mar. 23, 1976
	B 487,423	C	Mar. 2, 1976
	B 520,256	C	Jan. 13, 1976
	B 536,935	C	Jan. 13, 1976
239.1	B 371,095	C	Mar. 23, 1976
	B 372,016	C	Mar. 9, 1976
	B 538,753	C	Feb. 10, 1976
	B 547,208	C	Feb. 24, 1976
239.3A	B 506,148	C	Feb. 3, 1976
240A	B 484,067	C	Feb. 17, 1976
240G	B 482,709	C	Feb. 24, 1976
240R	B 491,711	C	Mar. 23, 1976
243C	B 442,810	C	Feb. 24, 1976
	B 473,039	C	Feb. 10, 1976
	B 473,040	C	Feb. 10, 1976
	B 516,047	C	Feb. 10, 1976
	B 516,296	C	Feb. 3, 1976
	B 526,096	C	Feb. 3, 1976
244R	B 348,433	C	Feb. 3, 1976
247.1R	B 457,931	C	Mar. 16, 1976
247.7T	B 468,052	C	Feb. 10, 1976
248AS	B 514,259	C	Mar. 23, 1976
248NS	B 537,711	C	Jan. 13, 1976
248.5	B 332,442	C	Mar. 30, 1976
249.6	B 344,669	C	Mar. 16, 1976

NOTE.—First number, class; second number, subclass; third number, document number

		CAT.	PUB. DATE
250BC	B 491,883	C	Feb. 3, 1976
250P	B 498,288	C	Mar. 23, 1976
251A	B 480,625	C	Feb. 24, 1976
256.4C	B 435,617	C	Mar. 16, 1976
256.4Q	B 503,345	C	Feb. 24, 1976
256.5R	B 531,096	C	Feb. 10, 1976
268BF	B 490,946	C	Feb. 17, 1976
268TR	B 539,374	C	Mar. 9, 1976
	B 563,070	C	Mar. 9, 1976
274SA	B 494,944	C	Feb. 17, 1976
283CN	B 461,685	C	Mar. 30, 1976
285.5	B 530,318	C	Jan. 13, 1976
287C	B 492,039	C	Feb. 24, 1976
287D	B 571,638	C	Mar. 9, 1976
288R	B 402,162	C	Mar. 2, 1976
290HL	B 537,053	C	Mar. 23, 1976
290R	B 445,493	C	Mar. 2, 1976
293.52	B 552,508	C	Mar. 16, 1976
293.54	B 545,464	C	Feb. 10, 1976
293.56	B 447,000	C	Feb. 3, 1976
293.57	B 426,802	C	Feb. 17, 1976
293.79	B 403,243	C	Mar. 30, 1976
294.8D	B 526,510	C	Jan. 20, 1976
294.8G	B 445,166	C	Mar. 2, 1976
294.9	B 494,339	C	Mar. 16, 1976
295.5A	B 515,642	C	Feb. 24, 1976
	B 545,299	C	Feb. 24, 1976
295.5B	B 458,617	C	Feb. 3, 1976
296R	B 429,027	C	Mar. 23, 1976
	B 477,252	C	Jan. 13, 1976
306.7C	B 385,024	C	Feb. 10, 1976
307D	B 486,280	C	Feb. 3, 1976
307G	B 568,405	C	Mar. 30, 1976
307H	B 471,836	C	Feb. 24, 1976
	B 554,848	C	Feb. 24, 1976
308A	B 488,111	C	Jan. 13, 1976
308D	B 532,005	C	Feb. 24, 1976
308R	B 471,494	C	Mar. 16, 1976
309.2	B 407,014	C	Mar. 16, 1976
	B 522,567	C	Feb. 17, 1976
	B 542,158	C	Jan. 13, 1976
309.6	B 521,025	C	Mar. 23, 1976
310R	B 535,437	C	Feb. 24, 1976
314.5	B 426,266	C	Mar. 2, 1976
325PH	B 440,548	C	Mar. 16, 1976
325R	B 427,946	C	Mar. 23, 1976
326HL	B 536,322	C	Mar. 23, 1976
326R	B 486,678	C	Mar. 2, 1976
	B 398,084	C	Feb. 3, 1976
326.5B	B 276,026	C	Feb. 3, 1976
	B 490,812	C	Mar. 30, 1976
326.5FN	B 484,269	C	Feb. 10, 1976
326.9	B 477,481	C	Feb. 3, 1976
326.12R	B 446,107	C	Mar. 9, 1976
326.13R	B 456,869	C	Mar. 9, 1976
327C	B 480,452	C	Feb. 10, 1976
330.5	B 552,498	C	Jan. 13, 1976
	B 574,996	C	Feb. 17, 1976
340.5	B 504,877	C	Feb. 24, 1976
340.9	B 476,372	C	Feb. 24, 1976
	B 521,643	C	Mar. 2, 1976
343.2R	B 491,032	C	Feb. 10, 1976
343.3	B 536,675	C	Jan. 20, 1976
343.3R	B 495,550	C	Feb. 3, 1976
	B 495,554	C	Feb. 3, 1976
345.9	B 450,701	C	Mar. 16, 1976
	B 450,708	C	Mar. 9, 1976
346.2M	B 440,858	C	Feb. 3, 1976
	B 302,160	C	Feb. 3, 1976
346.3	B 392,798	C	Mar. 30, 1976
346.4	B 485,051	C	Feb. 17, 1976
346.8R	B 369,373	C	Mar. 23, 1976
347.3	B 359,768	C	Mar. 30, 1976
348.5L	B 521,324	C	Jan. 27, 1976
348.6	B 546,295	C	Jan. 20, 1976
378	B 431,713	C	Feb. 10, 1976
397.4	B 450,693	C	Mar. 9, 1976
	B 484,068	C	Mar. 2, 1976
408	B 442,953	C	Mar. 23, 1976
429.7	B 464,587	C	Feb. 3, 1976
429.9	B 455,481	C	Feb. 24, 1976
438.1	B 518,656	C	Feb. 17, 1976
448R	B 495,781	C	Mar. 23, 1976
448.2H	B 390,408	C	Feb. 3, 1976
448.2N	B 412,830	C	Mar. 30, 1976
	B 551,463	C	Feb. 17, 1976
449M	B 521,985	C	Mar. 23, 1976
449R	B 526,942	C	Mar. 30, 1976
453PH	B 518,076	C	Mar. 30, 1976
456NS	B 484,419	C	Mar. 9, 1976
465H	B 573,991	C	Mar. 30, 1976
465.3	B 159,570	C	Mar. 23, 1976
465.5R	B 747,785	C	Feb. 10, 1976
465.7	B 564,252	C	Mar. 2, 1976
465.9	B 456,900	C	Feb. 3, 1976
	B 530,925	C	Feb. 24, 1976
471R	B 385,483	C	Feb. 17, 1976
	B 388,521	C	Jan. 13, 1976
472	B 472,256	C	Jan. 13, 1976
	B 491,052	C	Mar. 2, 1976
473S	B 532,140	C	Mar. 2, 1976
479C	B 483,746	C	Mar. 23, 1976
483	B 410,074	C	Feb. 24, 1976
493	B 351,455	C	Feb. 24, 1976
501.12	B 544,899	C	Feb. 17, 1976
513R	B 494,669	C	Feb. 3, 1976
514D	B 494,138	C	Mar. 23, 1976
514J	B 442,431	C	Mar. 23, 1976
515A	B 390,031	C	Jan. 13, 1976
516	B 386,828	C	Feb. 3, 1976
527R	B 467,328	C	Mar. 9, 1976
534R	B 301,143	C	Jan. 27, 1976
535P	B 426,157	C	Mar. 23, 1976
543F	B 504,582	C	Mar. 30, 1976
544C	B 471,116	C	Feb. 17, 1976
545R	B 357,526	C	Mar. 23, 1976
553R	B 391,473	C	Mar. 2, 1976
554	B 529,974	C	Feb. 17, 1976
557R	B 386,257	C	Feb. 3, 1976
561R	B 513,781	C	Feb. 24, 1976
562B	B 413,379	C	Mar. 9, 1976
565	B 533,652	C	Mar. 23, 1976
566A	B 513,014	C	Feb. 10, 1976
566R	B 421,373	C	Mar. 23, 1976
567.6M	B 480,114	C	Mar. 2, 1976
568	B 529,974	C	Feb. 17, 1976
578	B 449,837	C	Mar. 2, 1976
580	B 503,742	C	Feb. 17, 1976
586C	B 438,484	C	Feb. 17, 1976
591	B 416,257	C	Mar. 16, 1976
593R	B 468,350	C	Jan. 13, 1976
598	B 465,202	C	Feb. 24, 1976
	B 524,849	C	Mar. 23, 1976
601R	B 208,916	C	Jan. 13, 1976
604HF	B 472,241	C	Feb. 17, 1976
606.5P	B 518,326	C	Mar. 23, 1976
609E	B 474,573	C	Jan. 20, 1976
610A	B 845,044	C	Mar. 30, 1976
615A	B 409,310	C	Mar. 23, 1976
621H	B 501,128	C	Feb. 24, 1976
621K	B 470,348	C	Jan. 13, 1976
632R	B 553,584	C	Feb. 17, 1976
637R	B 519,446	C	Feb. 24, 1976
643R	B 480,662	C	Mar. 2, 1976
647	B 394,248	C	Jan. 27, 1976
648F	B 330,736	C	Feb. 3, 1976
665R	B 460,846	C	Feb. 24, 1976
668D	B 430,157	C	Feb. 17, 1976
674SA	B 426,274	C	Jan. 20, 1976
683.15D	B 428,103	C	Feb. 10, 1976
683.48	B 526,027	C	Feb. 17, 1976
859R	B 519,485	C	Feb. 10, 1976
873	B 388,675	C	Mar. 30, 1976
	B 465,688	C	Jan. 27, 1976
	B 519,486	C	Feb. 17, 1976
876B	B 575,851	C	Feb. 10, 1976
876R	B 589,966	C	Feb. 17, 1976
	B 461,184	C	Feb. 17, 1976
	B 580,826	C	Feb. 17, 1976
	B 589,966	C	Feb. 17, 1976
878R	B 469,468	C	Mar. 16, 1976
880B	B 510,458	C	Feb. 10, 1976
884	B 456,579	C	Feb. 10, 1976
890	B 495,408	C	Feb. 3, 1976
900	B 564,902	C	Mar. 23, 1976
927N	B 369,221	C	Feb. 24, 1976
	B 484,437	C	Mar. 30, 1976
929	B 502,993	C	Feb. 17, 1976
937	B 512,373	C	Feb. 10, 1976
940	B 496,430	C	Feb. 10, 1976
942	B 386,673	C	Feb. 3, 1976
948	B 534,591	C	Feb. 17, 1976
984	B 455,486	C	Mar. 16, 1976
Class 261			
39A	B 562,462	C	Jan. 13, 1976
98	B 480,702	C	Jan. 27, 1976
Class 264			
11	B 335,783	C	Mar. 30, 1976
36	B 308,659	C	Jan. 27, 1976
37	B 579,153	C	Mar. 30, 1976

NOTE.—First number, class; second number, subclass; third number, document number

		CAT.	PUB. DATE
49	B 417,164	C	Mar. 2, 1976
51	B 506,144	C	Feb. 10, 1976
	B 508,369	C	Jan. 13, 1976
140	B 214,925	C	Mar. 9, 1976
150	B 455,806	C	Mar. 23, 1976
161	B 555,437	C	Feb. 3, 1976
225	B 453,759	C	Jan. 27, 1976
315	B 485,169	C	Mar. 16, 1976
Class 270			
62	B 516,609	M	Feb. 24, 1976
Class 271			
180	B 435,481	M	Mar. 9, 1976
Class 274			
37	B 526,388	M	Feb. 3, 1976
Class 277			
27	B 544,034	M	Feb. 17, 1976
34.6	B 430,326	M	Mar. 23, 1976
81P	B 515,216	M	Feb. 17, 1976
184	B 426,819	M	Feb. 17, 1976
Class 280			
11.35R	B 435,570	M	Mar. 16, 1976
124F	B 471,706	M	Mar. 16, 1976
	B 550,810	M	Mar. 23, 1976
150AB	B 520,341	M	Mar. 16, 1976
150SB	B 363,565	M	Mar. 30, 1976
150.5	B 583,051	M	Feb. 3, 1976
236	B 572,642	M	Feb. 10, 1976
Class 281			
25R	B 491,618	M	Mar. 16, 1976
Class 290			
17	B 477,597	E	Feb. 17, 1976
Class 292			
254	B 549,964	M	Feb. 24, 1976
Class 293			
71P	B 552,932	M	Feb. 3, 1976
Class 296			
35R	B 443,647	M	Feb. 17, 1976
	B 463,671	M	Jan. 13, 1976
137A	B 452,034	M	Mar. 23, 1976
Class 297			
304	B 597,410	M	Mar. 30, 1976
Class 298			
35M	B 510,588	M	Jan. 27, 1976
Class 299			
31	B 499,209	M	Feb. 24, 1976
Class 303			
21BE	B 575,583	M	Mar. 16, 1976
71	B 545,856	M	Mar. 30, 1976
Class 305			
27	B 506,566	M	Jan. 20, 1976
Class 307			
88.3	B 540,872	E	Jan. 20, 1976
137	B 466,444	E	Jan. 20, 1976
205	B 444,437	E	Mar. 9, 1976
	B 513,368	E	Feb. 3, 1976
232	B 540,078	E	Jan. 13, 1976
251	B 503,371	E	Mar. 30, 1976
	B 506,840	E	Mar. 23, 1976
	B 548,302	E	Feb. 17, 1976
252B	B 523,226	E	Mar. 23, 1976
255	B 492,688	E	Jan. 20, 1976
262	B 525,133	E	Mar. 23, 1976
270	B 497,960	E	Jan. 20, 1976
293	B 519,932	E	Feb. 3, 1976
296	B 512,849	E	Feb. 3, 1976
Class 308			
9	B 391,797	M	Mar. 9, 1976
36.3	B 562,413	M	Mar. 16, 1976
207R	B 507,661	M	Mar. 2, 1976
Class 310			
4R	B 539,746	E	Feb. 17, 1976
9.6	B 501,482	E	Jan. 13, 1976
41	B 561,784	E	Jan. 27, 1976
90	B 458,500	E	Feb. 24, 1976
155	B 592,143	C	Jan. 27, 1976
168	B 526,289	E	Feb. 24, 1976
254	B 521,045	E	Feb. 24, 1976
	B 521,046	E	Feb. 24, 1976
259	B 521,044	E	Feb. 24, 1976
Class 313			
42	B 534,443	E	Jan. 27, 1976
60	B 513,706	M	Jan. 13, 1976
94	B 517,762	E	Mar. 16, 1976
99	B 518,859	E	Feb. 3, 1976
273	B 531,929	E	Jan. 20, 1976
330	B 504,056	C	Feb. 24, 1976
	B 520,884	E	Mar. 16, 1976
366	B 515,455	E	Jan. 27, 1976
404	B 523,696	E	Jan. 13, 1976
452	B 160,045	E	Jan. 13, 1976
477	B 279,969	E	Jan. 13, 1976
Class 315			
169TV	B 463,322	E	Jan. 20, 1976
	B 520,613	E	Mar. 16, 1976
241P	B 501,503	E	Mar. 2, 1976
371	B 483,615	E	Jan. 27, 1976
379	B 422,156	E	Mar. 23, 1976
388	B 516,002	E	Jan. 13, 1976
399	B 467,971	E	Jan. 13, 1976
408	B 516,564	E	Feb. 17, 1976
Class 317			
9R	B 488,634	E	Jan. 20, 1976
18D	B 340,170	E	Mar. 30, 1976
	B 534,915	E	Mar. 23, 1976
36TD	B 504,404	E	Feb. 24, 1976
100	B 508,639	E	Mar. 23, 1976
101A	B 420,472	E	Feb. 24, 1976
120	B 527,187	E	Feb. 17, 1976
	B 531,566	M	Mar. 16, 1976
124	B 509,606	E	Feb. 3, 1976
259	B 506,461	E	Jan. 20, 1976
Class 318			
98	B 475,801	E	Mar. 30, 1976
119	B 505,582	E	Mar. 23, 1976
139	B 475,236	E	Feb. 3, 1976
231	B 511,886	E	Feb. 3, 1976
257	B 502,973	E	Jan. 27, 1976
467	B 452,915	E	Mar. 30, 1976
593	B 476,967	E	Mar. 9, 1976
Class 321			
2	B 533,734	E	Jan. 27, 1976
7	B 509,185	E	Feb. 3, 1976
61	B 495,759	E	Feb. 3, 1976
Class 322			
25	B 466,318	E	Mar. 9, 1976
Class 323			
1	B 430,276	E	Jan. 20, 1976
17	B 459,811	E	Jan. 20, 1976
	B 583,089	E	Jan. 27, 1976
22T	B 501,181	E	Feb. 10, 1976
Class 324			
13	B 79,099	E	Jan. 13, 1976
15	B 495,331	E	Mar. 16, 1976
51	B 534,767	E	Feb. 3, 1976
60C	B 540,218	E	Feb. 10, 1976
62	B 465,393	E	Jan. 27, 1976
83D	B 458,010	E	Mar. 16, 1976
158R	B 483,268	E	Mar. 9, 1976
Class 325			
38A	B 478,234	E	Mar. 30, 1976
40	B 558,220	E	Jan. 27, 1976
468	B 544,961	E	Jan. 13, 1976
Class 328			
129	B 78,315	E	Feb. 10, 1976
155	B 550,693	E	Jan. 20, 1976
167	B 532,326	E	Mar. 23, 1976
168	B 573,033	E	Mar. 23, 1976
Class 330			
15	B 530,813	E	Feb. 17, 1976
17	B 531,686	E	Mar. 23, 1976
33	B 439,542	E	Jan. 27, 1976
207P	B 553,460	E	Feb. 3, 1976
Class 331			
44ST	B 527,669	E	Jan. 13, 1976
51	B 538,686	E	Jan. 13, 1976
94.5C	B 549,931	E	Jan. 20, 1976
94.5G	B 442,295	E	Mar. 16, 1976

NOTE.—First number, class; second number, subclass; third number, document number

		CAT.	PUB. DATE
94.5L	B 506,916	E	Feb. 3, 1976
94.5M	B 384,654	E	Feb. 24, 1976
94.5P	B 394,350	E	Jan. 13, 1976
116R	B 527,693	E	Feb. 3, 1976
117R	B 571,219	E	Feb. 24, 1976
Class 332			
9R	B 507,087	E	Feb. 17, 1976
Class 333			
10	B 535,256	E	Mar. 23, 1976
30R	B 453,616	E	Jan. 27, 1976
31A	B 568,770	E	Feb. 10, 1976
72	B 534,991	E	Jan. 27, 1976
73W	B 339,194	E	Feb. 3, 1976
81A	B 493,370	E	Mar. 16, 1976
Class 335			
7	B 509,165	E	Mar. 2, 1976
186	B 526,654	E	Mar. 23, 1976
210	B 541,517	E	Jan. 13, 1976
253	B 515,452	E	Feb. 10, 1976
Class 336			
65	B 523,952	E	Mar. 23, 1976
Class 338			
166	B 489,526	E	Feb. 3, 1976
202	B 528,761	E	Feb. 10, 1976
Class 339			
5M	B 566,556	C	Mar. 23, 1976
Class 340			
8L	B 270,274	E	Feb. 17, 1976
146.1AB	B 428,408	E	Mar. 2, 1976
167B	B 568,226	E	Feb. 24, 1976
171R	B 529,925	E	Mar. 30, 1976
172.5	B 391,844	E	Mar. 16, 1976
	B 428,271	E	Mar. 23, 1976
	B 432,140	E	Mar. 23, 1976
	B 452,138	E	Mar. 23, 1976
	B 461,336	E	Feb. 3, 1976
	B 482,907	E	Jan. 20, 1976
	B 485,575	E	Feb. 24, 1976
	B 503,780	E	Mar. 16, 1976
	B 506,839	E	Mar. 23, 1976
	B 533,454	E	Mar. 2, 1976
173FF	B 495,185	E	Mar. 9, 1976
173LM	B 453,067	E	Mar. 23, 1976
173R	B 545,945	M	Jan. 27, 1976
174DC	B 443,712	E	Jan. 27, 1976
174TF	B 429,018	C	Feb. 10, 1976
	B 455,425	E	Feb. 3, 1976
	B 472,276	E	Mar. 9, 1976
	B 476,681	E	Jan. 13, 1976
	B 499,718	E	Jan. 27, 1976
198	B 546,665	E	Jan. 20, 1976
347AD	B 507,647	E	Jan. 27, 1976
	B 526,106	E	Jan. 27, 1976
347CC	B 498,500	E	Jan. 20, 1976
347SY	B 270,351	E	Mar. 30, 1976
Class 343			
7A	B 248,240	E	Jan. 13, 1976
7.7	B 484,029	E	Feb. 10, 1976
8	B 497,702	E	Mar. 2, 1976
100LE	B 488,395	E	Jan. 27, 1976
	B 496,502	E	Jan. 20, 1976
786	B 547,994	E	Jan. 20, 1976
815	B 563,244	E	Jan. 27, 1976
840	B 494,691	E	Mar. 16, 1976
Class 346			
35	B 545,344 6E		Mar. 30, 1976
75	B 450,413	E	Mar. 23, 1976
	B 512,964	E	Feb. 10, 1976
139C	B 560,261	E	Mar. 16, 1976
Class 350			
7	B 469,036	M	Mar. 16, 1976
96WG	B 381,985	M	Feb. 3, 1976
	B 537,722	M	Feb. 3, 1976
103	B 586,663	M	Feb. 3, 1976
150	B 384,225	M	Mar. 16, 1976
160LC	B 527,054	M	Feb. 17, 1976
173	B 469,947	M	Jan. 20, 1976
310	B 520,543	M	Jan. 27, 1976
320	B 548,440	M	Feb. 3, 1976
Class 354			
23D	B 492,774	E	Mar. 9, 1976
46	B 515,135	E	Feb. 17, 1976
70	B 533,580	E	Feb. 3, 1976
156	B 507,131	E	Mar. 2, 1976
174	B 502,161	E	Mar. 2, 1976
288	B 559,111	E	Feb. 24, 1976
298	B 489,328	E	Jan. 20, 1976
Class 355			
8	B 509,474	M	Feb. 17, 1976
11	B 500,171	M	Mar. 30, 1976
16	B 481,048	M	Mar. 16, 1976
17	B 493,501	M	Feb. 3, 1976
Class 356			
103	B 517,504	M	Mar. 9, 1976
110	B 492,093	M	Mar. 23, 1976
201	B 450,521	M	Feb. 17, 1976
239	B 530,569	M	Mar. 16, 1976
Class 357			
15	B 281,162	E	Mar. 23, 1976
16	B 496,487	E	Jan. 20, 1976
22	B 480,749	E	Mar. 9, 1976
	B 504,503	E	Mar. 9, 1976
23	B 516,060	E	Feb. 17, 1976
36	B 508,961	E	Feb. 3, 1976
52	B 520,115	E	Mar. 23, 1976
55	B 480,292	E	Mar. 16, 1976
59	B 535,209	E	Mar. 16, 1976
65	B 470,798	E	Jan. 20, 1976
72	B 481,930	E	Feb. 24, 1976
Class 358			
8	B 554,939	E	Feb. 10, 1976
28	B 73,017	E	Mar. 9, 1976
41	B 502,289	E	Jan. 13, 1976
Class 360			
1	B 484,365	E	Jan. 27, 1976
15	B 283,941	E	Feb. 3, 1976
17	B 461,874	E	Jan. 27, 1976
27	B 427,883	E	Jan. 20, 1976
35	B 347,661	E	Mar. 16, 1976
49	B 516,069	E	Mar. 16, 1976
60	B 453,432	E	Mar. 16, 1976
	B 491,111	E	Feb. 17, 1976
78	B 487,411	E	Feb. 24, 1976
80	B 403,477	E	Feb. 3, 1976
81	B 500,176	E	Feb. 3, 1976
85	B 501,253	E	Feb. 3, 1976
98	B 484,482	E	Mar. 23, 1976
102	B 458,964	E	Mar. 2, 1976
125	B 59,512	E	Mar. 16, 1976
130	B 579,806	E	Feb. 3, 1976
137	B 449,892	E	Mar. 23, 1976
Class 401			
219	B 557,621	M	Feb. 3, 1976
Class 403			
107	B 513,789	M	Feb. 3, 1976
318	B 540,632	M	Jan. 13, 1976
341	B 510,278	M	Mar. 30, 1976
Class 404			
71	B 452,672	M	Jan. 13, 1976
77	B 434,206	M	Feb. 3, 1976
Class 408			
124	B 501,993	M	Jan. 13, 1976
146	B 521,986	M	Feb. 3, 1976
Class 415			
14	B 471,735	M	Feb. 3, 1976
115	B 561,712	C	Feb. 17, 1976
136	B 563,412	M	Feb. 24, 1976
213R	B 512,547	M	Jan. 13, 1976
214	B 552,006	M	Feb. 3, 1976
Class 416			
61	B 549,394	M	Jan. 27, 1976
145	B 567,158	M	Mar. 23, 1976
157B	B 513,346	M	Mar. 9, 1976
Class 417			
274	B 570,615	M	Mar. 23, 1976
Class 423			
15	B 372,722	C	Mar. 9, 1976
27	B 369,379	C	Mar. 30, 1976
238	B 485,401	C	Jan. 27, 1976
242	B 66,272	C	Feb. 24, 1976
244	B 499,324	C	Mar. 16, 1976
249	B 402,553	C	Feb. 17, 1976

NOTE.—First number, class; second number, subclass; third number, document number

		CAT.	PUB. DATE
	B 428,386	C	Mar. 23, 1976
283	B 521,984	C	Feb. 17, 1976
315	B 471,221	C	Jan. 13, 1976
390	B 549,198	C	Jan. 13, 1976
393	B 491,455	C	Feb. 3, 1976
406	B 111,130	C	Mar. 16, 1976
448	B 414,028	C	Feb. 17, 1976
462	B 336,754	C	Mar. 16, 1976
471	B 521,612	C	Mar. 9, 1976
573G	B 481,778	C	Mar. 30, 1976
580	B 379,177	C	Jan. 27, 1976
Class 424			
9	B 426,424	C	Feb. 3, 1976
45	B 181,208	C	Mar. 9, 1976
62	B 464,593	C	Mar. 9, 1976
70	B 438,048	C	Mar. 23, 1976
115	B 482,660	C	Feb. 10, 1976
118	B 542,226	C	Feb. 24, 1976
122	B 482,058	C	Mar. 2, 1976
	B 524,179	C	Jan. 13, 1976
129	B 848,336	C	Mar. 30, 1976
177	B 490,995	C	Feb. 3, 1976
203	B 576,903	C	Feb. 3, 1976
219	B 510,836	C	Mar. 23, 1976
230	B 487,133	C	Jan. 27, 1976
243	B 337,823	C	Mar. 23, 1976
245	B 493,955	C	Mar. 9, 1976
246	B 399,098	C	Feb. 24, 1976
251	B 450,870	C	Mar. 16, 1976
257	B 374,588	C	Jan. 27, 1976
258	B 426,639	C	Feb. 3, 1976
263	B 466,929	C	Jan. 27, 1976
267	B 307,698	C	Feb. 3, 1976
	B 407,737	C	Feb. 3, 1976
270	B 521,711	C	Feb. 10, 1976
273	B 459,408	C	Mar. 23, 1976
	B 566,464	C	Feb. 3, 1976
274	B 496,431	C	Jan. 13, 1976
	B 547,547	C	Feb. 24, 1976
281	B 587,786	C	Feb. 17, 1976
311	B 457,862	C	Jan. 27, 1976
317	B 510,850	C	Feb. 3, 1976
321	B 516,804	C	Mar. 23, 1976
326	B 510,957	C	Mar. 30, 1976
362	B 495,489	C	Feb. 3, 1976
Class 425			
222	B 163,463	M	Jan. 27, 1976
237	B 431,334	M	Mar. 16, 1976
339	B 555,456	M	Mar. 30, 1976
384	B 562,813	C	Feb. 3, 1976
521	B 411,765	M	Feb. 24, 1976
	B 548,688	M	Mar. 9, 1976

		CAT.	PUB. DATE
Class 426			
3	B 583,712	C	Feb. 10, 1976
73	B 493,950	C	Mar. 2, 1976
239	B 572,726	C	Feb. 24, 1976
276	B 535,944	C	Jan. 13, 1976
281	B 48,560	C	Mar. 30, 1976
	B 481,989	C	Mar. 23, 1976
	B 493,686	C	Mar. 23, 1976
332	B 441,789	C	Mar. 30, 1976
535	B 560,717	C	Feb. 10, 1976
548	B 439,778	C	Feb. 3, 1976
561	B 389,605	C	Mar. 23, 1976
594	B 333,838	C	Mar. 23, 1976
	B 431,797	C	Mar. 30, 1976
656	B 478,759	C	Mar. 16, 1976
	B 480,987	C	Mar. 30, 1976
Class 427			
39	B 476,837	C	Jan. 20, 1976
54	B 421,608	C	Mar. 23, 1976
70	B 381,709	C	Jan. 13, 1976
93	B 371,635	C	Mar. 23, 1976
123	B 552,709	C	Mar. 23, 1976
145	B 457,547	C	Feb. 17, 1976
186	B 537,085	C	Feb. 17, 1976
207	B 501,415	C	Jan. 13, 1976
343	B 160,099	C	Jan. 13, 1976
372	B 409,848	C	Jan. 27, 1976
389	B 519,377	C	Jan. 27, 1976
Class 428			
73	B 481,737	C	Jan. 13, 1976
132	B 333,110	C	Mar. 16, 1976
175	B 468,330	M	Mar. 16, 1976
224	B 378,760	C	Mar. 9, 1976
289	B 402,929	C	Feb. 3, 1976
315	B 373,354	C	Jan. 27, 1976
341	B 450,196	C	Feb. 10, 1976
378	B 415,590	C	Mar. 23, 1976
412	B 501,379	C	Mar. 30, 1976
428	B 554,655	C	Feb. 24, 1976
434	B 457,886	C	Jan. 13, 1976
447	B 456,069	C	Mar. 9, 1976
469	B 403,883	C	Mar. 23, 1976
515	B 474,747	C	Feb. 24, 1976
523	B 463,591	C	Mar. 30, 1976
537	B 459,821	C	Mar. 30, 1976
Class 431			
1	B 412,124	M	Mar. 23, 1976
175	B 534,313	M	Jan. 27, 1976
264	B 398,220	M	Feb. 3, 1976
Class 432			
49	B 536,511	M	Mar. 9, 1976

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 30TH DAY OF MARCH, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Dick Company: *See—*
Case, Brian J., 3,946,910.

A & E Plastik Pak Co., Inc.: *See—*
Crane, Walton B., 3,946,915.

A/S Fredrikkstad mek. Verksted: *See—*
Ludvigsen, Harald, 3,946,881.

A-T-O Inc.: *See—*
Specht, Glenn E., 3,946,756.

A.T.R. Equipment Industries Ltd.: *See—*
Plate, Gary G., 3,947,021.

A. Vuyk & Zonen's Scheepswerven B.V.: *See—*
van der Werff, Bartele, 3,946,686.

Aalo, Arnold, to Granges Essem Plast A/S. Tube haul-off machine. 3,946,924, Cl. 226-176.000.

AB Bofors: *See—*
Oler, Ernst Bertil, 3,946,823.
Pettersson, Henry Gustaf Erland; Skagerlund, Lars-Erik; and Stalfors, Rolf Lennart, 3,946,674.
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AB Casco: *See—*
Skoting, Lars-Goran, 3,947,064.

AB Kabi: *See—*
Jonsson, Nils Ake; Mikiver, Lembit; and Moses, Pinchas, 3,947,451.

Abbott, Edward H.; and Johnstone, Robert L., to Ford Motor Company. Method and apparatus for testing DC motors. 3,947,764, Cl. 324-158.0MG.

Abbott Laboratories: *See—*
Arendsen, David Lloyd; and Winn, Martin, 3,947,462.
Borodkin, Saul, 3,947,572.
Kyncl, Jaroslav; Lynn, Kathleen Riley; Martin, Yvonne Connolly; and Ours, Carroll Wayne, 3,947,590.

Abrioux, Andre; Bauer, Daniel; and Leroy, Jules, to L'Oreal. Device for measuring the force required to untangle hair. 3,946,606, Cl. 73-160.000.

Ace Envelope Manufacturing Corporation: *See—*
Ross, Joseph; and Fuchs, Ernest Frederick, 3,947,152.

Achelpohl, Fritz, to Windmoller & Holscher. Apparatus for severing sections from a web of material. 3,946,629, Cl. 83-304.000.

Adachi, Keiichi: *See—*
Mikawa, Akikazu; Horie, Ikutaro; Adachi, Keiichi; and Shiraishi, Hisashi, 3,947,274.

Adair, Edwin L. Urethral catheter and body drainage device. 3,946,741, Cl. 128-347.000.

Adam, Constantin I.: *See—*
Teodorescu, Constantin Gh.; Chiriac, Ilie C.; Adam, Constantin I.; Diaconescu, Marin R.; Dragan, Nicolae T.; and Ber, Wilhelm F., 3,947,216.

Adams, Gary V.; Minert, Roy T.; and Thurston, James R., to Thiokol Corporation. Rocket propelled projectile. 3,946,672, Cl. 102-49.400.

Adams, James E.: *See—*
Haas, Werner E. L.; Adams, James E.; and Richter, Bela, 3,947,183.

Adams, Patrick J., to Artex Hobby Products, Inc. Pressure control means for fluid applicator. 3,947,136, Cl. 401-188.00A.

Adan, John M.: *See—*
Newton, David W.; and Adan, John M., 3,946,738.

Addressograph-Multigraph Corporation: *See—*
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Adrian Const. Co.: *See—*
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Adrian, Rudolf: *See—*
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Adult Leisure Products Corporation: *See—*
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Aero-Dyne Manufacturing, Inc.: *See—*
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Affronte, Samuel J.: *See—*
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AGA Aktiebolag: *See—*
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Agence Nationale De Valorisation De La Recherche (ANVAR): *See—*
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AGFA-Gevaert: *See—*
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AGFA-Gevaert AG: *See—*
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Agrico Chemical Company: *See—*
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Agricultural Enterprises, Inc.: *See—*
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Ahmed, Kamal; and Kindell, Colin David, to AMP Incorporated. Edge contact. 3,947,083, Cl. 339-258.00P.

Air-Flo Company, Inc.: *See—*
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Air Industrie: *See—*
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Air Preheater Company, Inc., The: *See—*
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Airco, Inc.: *See—*
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Murakami, Noboru; Matsuo, Koichi; Hirosawa, Koichiro; and Ohara, Kazuo, 3,946,623.
Murakami, Noboru; Hirosawa, Koichiro; Ohara, Kazuo; and Matsuo, Koichi, 3,946,624.
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Ajdukovic, Marko. Lawn edging and sod cutting device. 3,946,815, Cl. 172-17.000.

Ajinomoto Co. Ltd.: *See—*
Misato, Tomomasa; Huang, Keng Tang; Homma, Yasuo; Kanao, Seizo; Toyoda, Takeshi; Suyama, Tadashi; and Shida, Toshiro, 3,947,589.

Akamatsu, Takashi; Koga, Koichi; Kondo, Mitsuru; Miyake, Makoto; Twasaki, Hiroshi; Matsuo, Masatoshi; Hotta, Seiji; Yuji, Isao; and Ito, Yukiaki, to Sumitomo Chemical Company, Ltd.; and Kanzaki Paper Manufacturing Co., Ltd. Benz (c) fluoran compounds and recording sheet containing them. 3,947,471, Cl. 260-335.000.

Aktiebolaget Carl Munters: *See—*
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Aktiebolaget Eminentverktyg: *See—*
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Aktiebolaget Svenska Flaktfabriken: *See—*
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Akzona Incorporated: *See—*
Woods, Gilbert Frederick; Cairns, James; and McGarry, George, 3,947,478.

Al-Shaikh, Al; and Dahlin, Erik B., to Measurex Corporation. Method and apparatus for controlling pulp refiners. 3,947,668, Cl. 235-151.120.

Aladdin Industries, Inc.: *See—*
Schifman, Edward J., 3,946,522.
Schifman, Edward J., 3,946,939.

Albano Enterprises, Inc.: *See—*
Albano, Joseph L.; and Harren, Hugh H., 3,946,710.

Albano, Joseph L.; and Harren, Hugh H., to Albano Enterprises, Inc. Supplemental air valves and supplemental air systems for internal combustion engines. 3,946,710, Cl. 123-119.00B.

Albers, Edwin W.; and Vaughan, David E. W., to W. R. Grace & Co. Method for producing open framework zeolites. 3,947,482, Cl. 260-448.00C.

Albrecht, William L., to Nalco Chemical Company. Silica sols containing large particle size silica. 3,947,376, Cl. 252-313.00S.

Albright, Alva Z. Stump gripper. 3,946,775, Cl. 144-34.00A.

Albright & Wilson Limited: *See—*
Edwards, Robert Harry; Williams, Thomas Alan; and Hall, Kenneth, 3,947,499.

Alcan Aluminum Corporation: *See—*
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Sturm, Winfried Gerhard, 3,946,872.

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Bark, Semen Efimovich; Garkusha, Ivan Semenovich; Kafyrin, Jury Pavlovich; Kreinin, Efim Vulfovich; Fedorov, Nikolai Ananievich; Shulyak, Vladimir Fedorovich; Khaitin, Alexandr Alexandrovich; Alexandrov, Sergei Gavrilovich; Bobrov, Marat Mikhailovich; Goman, Vyacheslav Grigorievich; Ermolaev, Viktor Sergeevich; Leonov, Sergei Vladimirovich; and Mikheev, Vikenty Pavlovich, 3,946,719.

Alfenaar, Marinus; and Jadoul, Desire J. N., to Stamicarbon, B.V. Preparation of cyanuric chloride. 3,947,419, Cl. 260-248.00C.

Alien, Imant Karlovich; Popov, Jury Olegovich; Stolov, Lev Isaakovich; Yanson, Boris Albertovich; Markov, Igor Alexandrovich; and Nikonenko, Anatoly Vasilievich. Device for selective search of objects using images thereof. 3,947,628, Cl. 178-6.800.

Allain, Charles V. Sugar cane planter. 3,946,899, Cl. 221-225.000.

Allen, Francis Edwin; and McGuire, James Daniel, to Letson and Burpee Ltd. Band mill strain mechanism. 3,946,634, Cl. 83-819.000.

Allen, James O. Auxiliary undercarriage for vehicles. 3,947,055, Cl. 280-47.150.

Allen, James W. Audio tachometer system. 3,947,814, Cl. 340-62.000.

Allied Chemical Corporation: *See—*
Peckinpaugh, Frank Lee; Prior, Duane Rae; and Benton, Kenneth Roberts, 3,946,664.
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Allis-Chalmers Corporation: *See—*
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Allmanna Svenska Elektriska Aktiebolaget: *See—*
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Alphamedics Mfg. Co.: *See—*
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Alps Electric Co., Ltd.: *See—*
Sato, Shoji, 3,947,772.

Alps Motorola, Inc.: *See—*
Suzuki, Shoji, 3,947,883.
Suzuki, Shoji, 3,947,895.

Altman, Gerald. Low profile episcopic projector and opaque materials therefor. 3,947,103, Cl. 353-66.000.

Altman, Morits Borisovich: *See—*
Tikhonova, Vera Viktorovna; Markov, Alexandr Ivanovich; Gerasimova, Marina Andreevna; Zhukova, Galina Ivanovna; Altman, Morits Borisovich; Timonova, Margarita Alexandrovna; Ershova, Tatyana Ivanovna; Krysin, Boris Trofimovich; Kitari-Oglu, Georgy Gerasimovich; Morozova, Galina Ivanovna; and Lashko, Nikolai Fedorovich, 3,947,268.

Alton Box Board Company: *See—*
Bonczyk, Bruno C., 3,946,935.

Aluminum Company of America: *See—*
Jordan, Charles L., 3,946,683.
Peterson, Richard W.; Carpenter, L. Graydon; and Kastelic, Raymond, 3,947,215.

Amancharla, Amareswar; and Young, Carter R., to Otis Engineering Corporation. Well tools. 3,946,807, Cl. 166-123.000.

Amari, Shinji; and Yamagiwa, Kazuo, to Sony Corporation. Color video signal reproducing apparatus. 3,947,871, Cl. 358-8.000.

American Can Company: *See—*
Hartman, William H.; Mietz, Raymond E.; Peschke, John R.; and Ruge, Donald H., 3,947,255.

American Challenger Corporation: *See—*
LaFoliette, Robert L.; and Miller, Kenneth H., 3,946,698.
LaFoliette, Robert L.; and Miller, Kenneth H., 3,946,841.

American Cyanamid Company: *See—*
Berenson, Herman, 3,947,583.
Burkhard, Herbert; Hsu, Nelson Nae-Ching; and Fetter, Edward Joseph, 3,947,400.
Feins, Irvin Ralph, 3,947,379.
Loffelman, Frank Fred; and Brady, Thomas Eugene, 3,947,374.
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American Flange & Manufacturing Co. Inc.: *See—*
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American Hoechst Corporation: *See—*
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American Home Products Corporation: *See—*
Immer, Hans U.; Nelson, Verner R.; and Gotz, Manfred K., 3,947,569.
Wei, Peter H. L.; and Bell, Stanley C., 3,947,439.

American Optical Corporation: *See—*
Grolman, Bernard; and Lavallee, Robert G., 3,947,099.
Walker, Terence, 3,947,122.

Ames, Ronald B.: *See—*
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Amiard, Yves; Bellissent, Jean -Paul; and Marie, Gilbert, to Societe Nationale des Petroles Aquitaine. Copolymers of olefins or olefins and non-conjugated dienes with unsaturated furan and/or thiophene derivatives. 3,947,430, Cl. 260-79.50P.

Amigues, Luc. Power loom dobby shedding motion. 3,946,766, Cl. 139-66.00R.

Amity Leather Products Co.: *See—*
Reis, John P., 3,946,781.

Amort, Andrew L., to Xerox Corporation. Method of photographing a plurality of cards. 3,947,118, Cl. 355-77.000.

AMP Incorporated: *See—*
Ahmed, Kamal; and Kindell, Colin David, 3,947,083.
Cobaugh, Robert Franklin; and Coller, James Ray, 3,946,477.

Ampoules, Inc.: *See—*
Hurscham, Alfred A., 3,946,732.

Anderson, Ronald A., to Schlumberger Technology Corporation. Methods and apparatus for determining characteristics of subsurface earth formations. 3,946,604, Cl. 73-152.000.

Anderson, Warren D., to FAG Bearings Corporation. Temperature compensated spindle. 3,947,079, Cl. 308-228.000.

Anderson, Warren W. Inter arc ingredient mixer. 3,946,995, Cl. 259-9.000.

Andreiko, Craig A.: *See—*
Miller, Frank R.; Andreiko, Craig A.; and Di Giulio, John H., 3,946,488.

Andrews, Bethlehem K.; Frick, John G., Jr.; and Reeves, Wilson A., to United States of America, Agriculture. Process for reducing agent migration during treatment of knitted cotton fabric. 3,947,613, Cl. 427-242.000.

Andrianov, Kuzma Andrianovich; Gandurin, Lev Ivanovich; Davydova, Alexandra Fedorovna; and Sidorov, Vyacheslav Ivanovich. Size for textile yarns and method of sizing thereof. 3,947,366, Cl. 252-8.600.

Apollo-Dynamic Corporation Limited, The: *See—*
Cherry, Richard Sutton, 3,947,357.

Applied Futures, Inc.: *See—*
Simmons, William W.; and Marquis, James A., 3,947,669.

Arai, Michio, to Sony Corporation. Peak level indicator. 3,947,761, Cl. 324-103.00P.

Archer, Edward, to Lawrence Peska Associates, Inc., a part interest. Map board game. 3,947,038, Cl. 273-134.0AC.

Archer, Michel J. M.; Battut, Henri-Claude L.; Bonami, Robert R. C.; and Louboutin, Herve J. P. M., to International Standard Electric Corporation. Synchronizing circuit including two flip-flops and circuit means to protect a synchronized signal from an unstable state of the flip-flops. 3,947,697, Cl. 307-208.000.

Arendsen, David Lloyd; and Winn, Martin, to Abbott Laboratories. 2,4,7-substituted 5-hydroxy benzopyrans and esters. 3,947,462, Cl. 260-295.00F.

Ariyama, Kenzo: *See—*
Ohshima, Iwao; Chiba, Seiichi; Ariyama, Kenzo; Ogawa, Yasuo; and Ozaki, Masahide, 3,947,518.

Armco Steel Corporation: *See—*
d'Entremont, John C.; and Taylor, Charles R., 3,947,267.

Armetti, Massimo. Container making machine. 3,946,929, Cl. 228-15.100.

Armour Pharmaceutical Company: *See—*
Hughes, John Lawrence; and Liu, Robert Chung-Huan, 3,947,455.
Jones, John L.; Rubino, Andrew M.; and Lindahl, Charles B., 3,947,556.
Jones, John L.; Rubino, Andrew M.; and Lindahl, Charles B., 3,947,557.

Armstrong, Donald E.: *See—*
Audesse, Emery G.; Armstrong, Donald E.; and Sindlinger, Ronald E., 3,947,225.

Armstrong, Henry P., to Elca Designs Limited. Muntin bar unitary frame. 3,946,531, Cl. 52-456.000.

Armstrong, Jack W., to Lipe Rollway Corporation. Self-propelled pipe cleaner. 3,946,459, Cl. 15-377.000.

Aronstein, Jesse; and Harding, William E., to International Business Machines Corporation. Continuous processing system. 3,946,484, Cl. 29-569.00R.

Artemiev, Lev Nikolaevich: *See—*
Zhuchkov, Ivan Ilich; Filonov, Viktor Sergeevich; Zaitsev, Boris Ivanovich; Artemiev, Lev Nikolaevich; and Rakhimov, Vladimir Vildanovich, 3,947,318.

Artex Hobby Products, Inc.: *See—*
Adams, Patrick J., 3,947,136.

Arvanitis, Aristotelis; Malinowski, Stanley; Smith, Craig P., deceased; and by Page, Paul N., administrator, to Motorola, Inc. Dual-coupled monolithic crystal element for modifying response of filter. 3,947,784, Cl. 333-72.000.

Arvin Industries, Inc.: *See—*
Hall, Robert P., Sr., 3,947,893.

Asahi Glass Company, Ltd.: *See—*
Asawa, Tatsuro; and Gunjima, Tomoki, 3,947,351.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Miyazaki, Ken; Kubota, Narumi; Igarashi, Kooichi; Sato, Hiroshi; Takahashi, Kazutoshi; Maki, Takeshi; Hatano, Akira; and Kai, Masamitsu, 3,946,625.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
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Asai, Shinichiro: *See—*
Horiie, Shigeki; Kurematsu, Susumu; Asai, Shinichiro; and Saito, Chiaki, 3,947,536.

Asai, Takeo, to Teijin Ltd. Process for thermoremanent duplication of magnetic recording master tape onto slave tape with reduced dimensional changes of slave tape. 3,947,872, Cl. 360-16.000.

Asamura, Takashi; Sawai, Shigeki; Sakamoto, Keisuke; Ikeda, Hajime; and Toshimitsu, Tohoru, to Nippon Steel Corporation. Method for temper rolling of a thin-gauge steel strip. 3,947,294, Cl. 148-12.00C.

Asawa, Tatsuro; and Gunjima, Tomoki, to Asahi Glass Company, Ltd. Acid diffusion-dialysis process utilizing anion exchange membrane of 4-55 micron thickness. 3,947,351, Cl. 210-22.00R.

Ashcraft, Thomas L., Jr.: *See—*
Gale, Walter W.; Ashcraft, Thomas L., Jr.; and Saunders, Rhoderick K., 3,946,812.

Asinger, Friedrich; and Offermanns, Heribert, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Salts of phenylpropanolamine with thiazolidine carboxylic acids. 3,947,464, Cl. 260-306.70C.

Aspen Industries, Inc.: *See—*
Stepanek, Frank N., Jr., 3,946,902.

Astec Industries, Inc.: *See—*
Mize, Erbie Gail, 3,946,772.

Atlantic Research Corporation: *See—*
Goede, Philip J., 3,946,555.

Atlas Copco Aktiebolag: *See—*
Ek, Klas Goran Gunnarsson, 3,946,818.
Olofsson, Hans Kristoffer, 3,947,163.

Atsuta, Masayuki, to Nippon Gakki Seizo Kabushiki Kaisha. Upright piano action. 3,946,635, Cl. 84-242.000.

Audesse, Emery G.; Armstrong, Donald E.; and Sindlinger, Ronald E., to GTE Sylvania Incorporated. Photoflash lamp. 3,947,225, Cl. 431-95.00R.

Auerbach, Albert A., to Medalert Corporation. Electrocardiography signal transmission-reception method including method of measuring pacemaker signal frequency. 3,946,744, Cl. 128-419.0PT.

Auto Research Corporation: *See—*
Smith, Carl H.; and Sidler, August X., 3,947,836.

Automatisme et Technique: *See—*
Bardet, Gerard, 3,947,420.

Avery, Norman R.: *See—*
Valentine, Richard E.; and Avery, Norman R., 3,946,665.

Ayres, Ralph E.; Cleereman, Kenneth J.; and Schrenk, Walter J., to Dow Chemical Company, The. Scrapless forming of plastic articles. 3,947,204, Cl. 425-383.000.

Ayukawa, Taizo: *See—*
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B. F. Goodrich Company, The: *See—*
Babbin, William R.; and Sabo, Stephen C., 3,946,918.
Daniels, William L., Sr., 3,946,838.

B. & J. Jacobs Co., Inc.: *See—*
Jacobson, Isadore A.; and Sepate, Michael D., 3,946,528.

B.S.R. (U.S.A.) Ltd.: *See—*
Meyerle, George M., 3,947,642.

Babbin, William R.; and Sabo, Stephen C., to B. F. Goodrich Company, The. Hose feeder. 3,946,918, Cl. 226-1.000.

Babcock & Wilcox Co., The: *See—*
Cooper, Adrianus A. G.; and Leopold, Phillip M., 3,947,686.

Babson, Arthur L., to Warner-Lambert Company. Adsorbed plasma. 3,947,378, Cl. 252-408.000.

Backers, Franciscus Theodorus; and Wessels, Johannes Hendrik, to U.S. Philips Corporation. Magnetic recording and reproducing apparatus with tape tension control. 3,947,880, Cl. 360-71.000.

Bacon, James F., to United Technologies Corporation. High modulus rare earth and beryllium containing silicate glass compositions. 3,947,281, Cl. 106-52.000.

Bacskai, Robert, to Chevron Research Company. Polymerization of vinylpyridine. 3,947,526, Cl. 260-878.00R.

Bader, Alfons: *See—*
Neumann, Ernst-Georg; Tewes, Giesbert; and Bader, Alfons, 3,947,226.

Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Belde, Horst; Oppenlaender, Knut; Daubach, Ewald; and Fikentscher, Rolf, 3,947,287.

Bagg, Greville Euan Gordon; Edwards, Henry; Evans, Michael Ernest Newcombe; Lewis, John Arnold; and Ziebland, Hans, to National Research Development Corporation. Aligning fibres. 3,947,535, Cl. 264-87.000.

Baggett, Joseph M., to Dow Chemical Company, The. Wet strength resin. 3,947,383, Cl. 260-2.0BP.

Bahnck, Norman; Booth, Raymond H.; Boyer, John A.; and Monahan, Jack J., to Western Electric Company, Inc. Methods of and apparatus for bonding an article to a substrate. 3,946,931, Cl. 228-102.000.

Bahnsen, Erwin B., to Steiner American Corporation. Automatic towel winding machine. 3,946,961, Cl. 242-67.10R.

Bahre, Karl: *See—*
Krohm, Reinhold; and Bahre, Karl, 3,946,860.

Bailey, Escar L.: *See—*
Rodgers, Aubrey; Bailey, Escar L.; and Widner, Rayburn K., 3,946,967.

Bailey, Paul T.: *See—*
Craford, Magnus George; and Bailey, Paul T., 3,947,840.

Bailey, Russell O.; and Stone, William S., to S-P Products, Inc. Pneumatic engraving tool. 3,946,491, Cl. 33-23.00R.

Baker, Don R., to Stauffer Chemical Company. Organotin miticidal and insecticidal compounds. 3,947,461, Cl. 260-299.000.

Baker, Don R., to Stauffer Chemical Company. Organotin miticidal and insecticidal compounds. 3,947,481, Cl. 260-429.700.

Baker, Don R.: *See—*
DeBaun, Jack R.; Pallos, Ferenc M.; and Baker, Don R., 3,947,475.

Bakhtin, Jury Grigorievich: *See—*
Ryss, Jury Samuilovich; Bakhtin, Jury Grigorievich; Chamaev, Viktor Nikolaevich; and Panteleimonov, Vladimir Mikhailovich, 3,947,756.

Baklanov, Nikolai Mikhailovich; Buslakova, Ljubov Pavlovna; Nekorystnova, Raisa Mikhailovna; Novikov, Anatoly Artemievich; Repenkova, Tatyana Grigorievna; Rumyantsev, Ivan Ivanovich; Sapogova, Galina Alexandrovna; Solodovnik, Nikolai Pavlovich; and Fridman, Viktor Mironovich. Method of producing phosphorus-containing fertilizers. 3,947,262, Cl. 71-37.000.

Baldwin, John J.; and Novello, Frederick C., to Merck & Co., Inc. Anti-hyperuricemia composition. 3,947,577, Cl. 424-263.000.

Balkan, Maury: *See—*
Vadik, George; and Balkan, Maury, 3,946,519.

Ball Brothers Research Corporation: *See—*
Bamberg, Jack A.; Bucher, Hans R.; and Bultena, John G., 3,947,119.

Ball Corporation: *See—*
Cerny, Daryl D.; Cannon, Robert W.; Okeley, Robert E., II; and Sannella, Joseph L., 3,946,670.

Ball, Kenneth H.; and Cole, Arthur L., Jr., to Walt Disney Productions. Boat guidance system. 3,947,741, Cl. 318-588.000.

Balme, Maurice; and Gruffaz, Max, to Rhone-Poulenc, S.A. Process for the production of maleamic acids. 3,947,493, Cl. 260-518.00R.

Balzers Patent- und Beteiligungs AG: *See—*
Flad, Hermann, 3,947,092.

Bamberg, Jack A.; Bucher, Hans R.; and Bultena, John G., to Ball Brothers Research Corporation. Active sensor automatic range sweep technique. 3,947,119, Cl. 356-5.000.

Banahan, Robert J. Ambulatory tar applicator. 3,946,722, Cl. 126-343.50A.

Bandoh, Tadaaki: *See—*
Kobayashi, Yoshiki; Bandoh, Tadaaki; and Hara, Toshitaka, 3,947,818.

Bangor Punta Operations, Inc.: *See—*
Nisley, Irvin A.; and Kuhl, James R., 3,947,066.

Bar-Issac, Charles; Frei, Ephraim; and Shtrikman, Shmuel, to Yeda Research and Development Co. Ltd. Gem identification. 3,947,120, Cl. 356-30.000.

Barber, Jerry. Golf club. 3,947,041, Cl. 273-167.00G.

Bardet, Gerard, to Automatisme et Technique. Method for producing foundry moulds and cores as well as products thereby obtained. 3,947,420, Cl. 260-38.000.

Bark, Semen Efimovich; Garkusha, Ivan Semenovich; Kafyrin, Jury Pavlovich; Kreinin, Efim Vulfovich; Fedorov, Nikolai Ananievich; Shulyak, Vladimir Fedorovich; Khaitin, Alexandr Alexandrovich; Alexandrov, Sergei Gavrilovich; Bobrov, Marat Mikhailovich; Goman, Vyacheslav Grigorievich; Ermolaev, Viktor Sergeevich; Leonov, Sergei Vladimirovich; and Mikheev, Vikenty Pavlovich. Radiant gas heater. 3,946,719, Cl. 126-91.00A.

Barker, Robert S., to Halcon International, Inc. Catalyst and use thereof. 3,947,474, Cl. 260-346.80A.

Barmag Barmer Maschinenfabrik Aktiengesellschaft: *See—*
Gergely, Gerhard, 3,946,996.

Barnes, Douglas Charles, to National Research Development Corporation. Subjecting materials to high pressure. 3,947,541, Cl. 264-332.000.

Barr, Russell L.; and Affronte, Samuel J. Economizer kit for air conditioning systems. 3,946,575, Cl. 62-176.000.

Barrett, Colin; and Cash, Peter, to U.S. Philips Corporation. Tumbler drum for a domestic appliance. 3,946,500, Cl. 34-139.000.

Barry, Charles B., to Ralph M. Parsons Company, The. In situ recovery of hydrocarbons from tar sands. 3,946,810, Cl. 166-272.000.

Barry Wright Corporation: *See—*
Radford, Michael Harold, 3,946,976.

Barthel, Hans: *See—*
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Bartoli, Francesco: *See—*
Dinelli, Dino; Bartoli, Francesco; and Gulinelli, Silvio, 3,947,325.

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Fischer, Adolf; Koenig, Karl-Heinz; and Kolbinger, Rudolf, 3,947,485.
Kummer, Rudolf, 3,947,503.
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Bashyam, Ramaswami: *See—*
DeGraauw, Henk Anthony; and Bashyam, Ramaswami, 3,947,643.

Bassett, John W. Suturing device. 3,946,740, Cl. 128-334.00R.

Basu, Samir; and Maguire, Gerald J., to Xerox Corporation. Exposure control system. 3,947,117, Cl. 355-68.000.

Bateman, Charles Donald, to Sundstrand Data Control, Inc. Excessive descent rate warning system for aircraft. 3,947,808, Cl. 340-27.0AT.

Bateman, Charles Donald, to Sundstrand Data Control, Inc. Below glide slope advisory warning system for aircraft. 3,947,809, Cl. 340-27.0AT.

Bateman, Charles Donald; and Muller, Hans Rudolf, to Sundstrand Data Control, Inc. Negative climb rate after take-off warning system with predetermined loss of altitude inhibit. 3,947,810, Cl. 340-27.0AT.

Bates, Barstow; and Ishler, Norman H., to Phoenix Research Inc. Effervescent cosmetic compositions. 3,947,568, Cl. 424-47.000.

Bates Printing Specialties, Inc.: *See—*
Brown, Lyman J., 3,946,936.

Battilana, Ann C.: *See—*
Battilana, Remeo A.; and Battilana, Ann C., 3,947,676.

Battilana, Remeo A.; and Battilana, Ann C., to Raymond Lee Organization, Inc., The, a part interest. Portable head lamp. 3,947,676, Cl. 240-6.40W.

Battut, Henri-Claude L.: *See—*
Archer, Michel J. M.; Battut, Henri-Claude L.; Bonami, Robert R. C.; and Louboutin, Herve J. P. M., 3,947,697.

Bauer, Daniel: *See—*
Abrioux, Andre; Bauer, Daniel; and Leroy, Jules, 3,946,606.

Bauer, Hans Jurgen: *See—*
Bauer, Hans-Peter; and Bauer, Hans Jurgen, 3,947,006.

Bauer, Hans-Peter; and Bauer, Hans Jurgen. Gas spring, piston locking. 3,947,006, Cl. 267-120.000.

Bauer, Norman A.: *See*—
Takata, Harry H.; and Bauer, Norman A., 3,947,142.

Bauman, Joel: *See*—
Nichols, Herbert F., 3,947,750.

Baumann, Emil, to Contraves AG. Mobile anti-aircraft device. 3,946,640, Cl. 89-1.815.

Baxter Laboratories, Inc.: *See*—
Pollack, Vincent A., 3,947,250.

Bayer Aktiengesellschaft: *See*—
Claussen, Uwe, 3,947,412.
Eibl, Johannes; Wolf, Karlheinz; and Prochaska, Helmut, 3,947,246.
Jager, Horst, 3,947,477.
Kishino, Shigeo; Kudamatsu, Akio; Takase, Iwao; Shiokawa, Kozo; and Yamaguchi, Shin-Ichi, 3,947,529.
Kuhle, Engelbert; Klauke, Erich; and Frohberger, Paul-Ernst, 3,947,513.
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Mansmann, Manfred, 3,947,534.
Mitrowsky, Alexander; Klappert, Helmut; Zenner, Karl-Friedrich; and Hagen, Wilhelm, 3,947,484.
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BBC Brown, Boveri & Company Limited: *See*—
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Rohr, Franz; Holtschmit, Heinz; and Siewerth, Gerhard, 3,947,606.

Beachler, Edward D.: *See*—
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Beal, Ira W., to Funk Seeds International, Inc. Method for palletizing. 3,946,883, Cl. 214-152.000.

Bear Brand Hosiery Co.: *See*—
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Bechstein, Herbert; Biebl, Herbert; Eckell, Wolfgang; Franz, Anton; Hofmann, Eberhard; Stauch, Hans; Staudt, Heinrich; Tomasch, Hellmut; Urlberger, Alois; and Winnewisser, Theodor, to Robert Bosch GmbH. Device and a process for adjusting the delivery quantity of multi-cylinder fuel injection pumps. 3,946,590, Cl. 73-1.00R.

Becker, Erich. Diaphragm pump, particularly for the generation of vacuum. 3,947,156, Cl. 417-437.000.

Becker, Otto Alfred. Protection from corrosion of resistance-welded sheet metal covered with non-metallic layers. 3,947,614, Cl. 427-284.000.

Beckwith, Athelstan L. J., to Sherwin-Williams Company, The. Azaisatoic anhydrides. 3,947,416, Cl. 260-244.00R.

Beckwith, Athelstan L. J., to Sherwin-Williams Company, The. Method for producing heterocyclic acid anhydrides and pyrimidinediones. 3,947,442, Cl. 260-256.40F.

Beekhuis, William H., Jr. Exhaust system and method. 3,946,558, Cl. 60-274.000.

Beer, Klaus, to Goodyear Tire & Rubber Company, The. Lateral force variation correction of pneumatic tires. 3,946,527, Cl. 51-281.00R.

Behr, Erich: *See*—
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Behrens, Joh. Friedrich: *See*—
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Belde, Horst; Oppenlaender, Knut; Daubach, Ewald; and Fikentscher, Rolf, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Aqueous pigment dispersions. 3,947,287, Cl. 106-308.00Q.

Bell, George; Rance, David G.; and Raxworthy, Sydney, to Metal Box Limited. Apparatus for jet soldering containers. 3,946,930, Cl. 228-41.000.

Bell, Stanley C.: *See*—
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Bell Telephone Laboratories, Incorporated: *See*—
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Bellissent, Jean -Paul: *See*—
Amiard, Yves; Bellissent, Jean -Paul; and Marie, Gilbert, 3,947,430.

Beloit Corporation: *See*—
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Belshaw, Thomas E.; Woodworth, Fred G.; and Wilke, Wilbur D., to Belshaw Bros., Inc. Apparatus for making filled food products. 3,947,178, Cl. 425-132.000.

Belsky, Robert. Automatic emergency bilge water pumpout system. 3,946,694, Cl. 114-183.00R.

Bender, Louis R., to Thomas & Betts Corporation. Tooth configuration for an electrical connector. 3,947,082, Cl. 339-97.00R.

Bendix Corporation, The: *See*—
Presley, Rex Wallace; and Lorraine, Jack Richardson, 3,947,711.

Beneteau, Stanley Alexander: *See*—
Proulx, Sylvester Eugene; and Beneteau, Stanley Alexander, 3,946,472.

Benfield Corporation, The: *See*—
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Goldfarb, Adolph E.; and Benkoe, Erwin, 3,946,520.
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Goldfarb, Adolph E.; Benkoe, Erwin; and Merino, Dennis H., 3,947,030.
Goldfarb, Adolph E.; and Benkoe, Erwin, 3,947,031.

Bennett, Harold E.; Soileau, Marion J.; and Hutcheson, Guilford J., to United States of America, Navy. Optical component functional tester. 3,947,127, Cl. 356-124.000.

Bennett, Randall A. Steer roping training device. 3,947,033, Cl. 273-105.200.

Benson, Clark K.: *See*—
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Benson, Richard W. H., to Imperial Chemical Industries Limited. Polyester fibers and tows. 3,946,469, Cl. 28-72.140.

Bentley Engineering Co. Ltd., The: *See*—
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Bentley, George; and Deane, Graham, to National Research Development Corporation. Endoprosthetic bone joint. 3,946,445, Cl. 3-1.910.

Benton, Kenneth Roberts: *See*—
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Ber, Wilhelm F.: *See*—
Teodorescu, Constantin Gh.; Chiriac, Ilie C.; Adam, Constantin I.; Diaconescu, Marin R.; Dragan, Nicolae T.; and Ber, Wilhelm F., 3,947,216.

Berenson, Herman, to American Cyanamid Company. Method for controlling fungi utilizing pyrazolinium compounds. 3,947,583, Cl. 424-273.000.

Berg, Lawrance F.; and Prillinger, Peter F. M., to Caterpillar Tractor Co. Sealed ball and socket connection. 3,947,077, Cl. 308-187.100.

Berg, Robert C., Jr.; Ishler, Norman H.; and Jellema, Joseph, to Phoenix Research Inc. Effervescent cleansers. 3,947,567, Cl. 424-45.000.

Bergkamp, Melvin A.: *See*—
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Bergling, Charles Gunnar Birger, to ESAB-Hebe AB. Plant for applying and welding reinforcing elements onto a metal plate. 3,946,933, Cl. 228-212.000.

Bergwerksverband GmbH: *See*—
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Berkley & Company, Inc.: *See*—
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Berman, Richard M.; and Schwartz, Bernard, to Alphamedics Mfg. Co. Self-contained vacuum aspirator. 3,946,739, Cl. 128-304.000.

Berry, William R., to Schantz, Spencer C. Solenoid. 3,947,788, Cl. 335-68.000.

Berve, Jurgen, to Fried. Krupp Huttenwerke AG. Vacuum sealing for the discharge nozzle of a casting ladle serving as a vacuum container. 3,946,907, Cl. 222-152.000.

Berzinya, Anna Eduardovna: *See*—
Giller, Solomon Aronovich; Zhuk, Regina Abramovna; Berzinya, Anna Eduardovna; and Sherinya, Laima Avgustovna, 3,947,444.

Besse, Pierre. Guidance arrangement for opening and closing panels articulated relative to each other and relative to a stationary frame. 3,946,790, Cl. 160-206.000.

Bettex, Marcel, to Protek A.G. Surgical device. 3,946,728, Cl. 128-69.000.

Betts, William L., to NCR Corporation. System for synchronizing local pseudo-noise sequence to a received baseband signal. 3,947,634, Cl. 178-69.5DC.

Betz Laboratories, Inc.: *See*—
Swered, Paul; and Michael, Dana U., 3,947,581.

Bianchi, Giuseppe; and Nidola, Antonio, to Electronor Corporation. Novel cathode. 3,947,333, Cl. 204-129.000.

Bickl, Horst: *See*—
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Biebl, Herbert: *See*—
Bechstein, Herbert; Biebl, Herbert; Eckell, Wolfgang; Franz, Anton; Hofmann, Eberhard; Stauch, Hans; Staudt, Heinrich; Tomasch, Hellmut; Urlberger, Alois; and Winnewisser, Theodor, 3,946,590.

Bieganski, Zdzislaw. Tools for cutting. 3,946,487, Cl. 30-90.700.

Bierwas, Reinhard. Cassette container. 3,946,865, Cl. 206-387.000.

Biname, Robert: *See*—
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Bio-Rad Laboratories: *See*—
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Biola, Georges; and Schneider, Gerard, to Rhone-Progil. Process for the continuous preparation of propylene oxide. 3,947,476, Cl. 260-348.50V.

BioMagnetics, International Inc.: *See*—
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Biopulse Company Limited: *See—*
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Bird, David Alexander: *See—*
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Birge, Jackson P., II; and Bradshaw, David A., to Progressive Engineering Design. Convertible vehicle platform and shelf apparatus. 3,946,678, Cl. 108-44.000.

Birtcher Corporation, The: *See—*
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Bishop, E. Dennis: *See—*
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Bitterice, Michael G., to PPG Industries, Inc. Security glazing and alarm system. 3,947,837, Cl. 340-274.00R.

Black, Arthur L.; and Riggs, Thomas C., to Ingersoll-Rand Company. Housing and shaft arrangement. 3,947,160, Cl. 418-60.000.

Black Clawson Company, The: *See—*
Chupka, David E.; Lehman, Donald F.; and Kohr, Gilbert E., 3,947,314.

Blankenship, Ben F. Gyroscopically stabilized, vertical takeoff and landing aircraft. 3,946,970, Cl. 244-23.00C.

Blankinship, William A., to United States of America, Army. Pitch analyzer using log-tapped delay line. 3,947,638, Cl. 179-1.0SA.

Blauschild, Robert A., to Signetics. Low resistance microcurrent regulated current source. 3,947,704, Cl. 307-297.000.

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Bockwoldt, Walter H., to Hughes Aircraft Company. Scan convertor. 3,947,826, Cl. 340-173.00R.

Bodmer, Maurice; Hartinger, Edmund; and Huber, Albert, to BBC Brown, Boveri & Company Limited. Procedure for sealing leaks in closed cooling systems. 3,947,610, Cl. 427-142.000.

Boehringer Mannheim GmbH: *See—*
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Werner, Wolfgang; Vogel, Peter; Tiedemann, Hugo; and Guthlein, Werner, 3,947,377.
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Bogenschutz, Thomas M., to General Signal Corporation. Hydraulic brake actuating and locking device. 3,946,642, Cl. 92-24.000.

Bolshov, Vladimir Mikhailovich; Voinov, Vyacheslav Evgenievich; Kletskin, Solomon Zalmanovich; Ostrovsky, Viktor Julievich; Soloviev, Valery Vladimirovich; and Ter-Kasparova, Nina Yakovlevna. Method for controlling the level of anaesthesia in surgery and apparatus for effecting same. 3,946,725, Cl. 128-2.06R.

Bolton-Emerson, Inc.: *See—*
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Bom, Cornelis Johannes Gerardus: *See—*
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Bonczyk, Bruno C., to Alton Box Board Company. Bulk material packaging container. 3,946,935, Cl. 229-37.00R.

Bond, Richard S., to Rock Industries Machinery Corporation. Multiple section wear plate for a rock crusher. 3,946,955, Cl. 241-264.000.

Booras, Peter J., to Yankee Artists, Inc. Scene-changing display card. 3,946,508, Cl. 40-124.100.

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Born, Peter Jeremy; and Robertson, Daniel Stewart, to British Secretary of State for Defence. Preparation of indium phosphide. 3,947,549, Cl. 423-299.000.

Bornert, Paul, to Air Industrie. Method and installation for the stoving of articles. 3,947,235, Cl. 432-2.000.

Borodkin, Saul, to Abbott Laboratories. Iron-resin adsorbate. 3,947,572, Cl. 424-79.000.

Bouchard, Andre, to Lawrence Peska Associates, Inc., a part interest. Pool disc game. 3,947,035, Cl. 273-126.00R.

Bouchard, Andre C.; Waymouth, John F.; Sentementes, Thomas J.; and Jirmanus, Naila Saba, to GTE Sylvania Incorporated. Photoflash lamp. 3,947,223, Cl. 431-94.000.

Bourgeois, Francis H.; and McArdle, Edward J., to Illinois Tool Works Inc. Carrier applicating machine and method. 3,946,535, Cl. 53-35.000.

Bourne, Alan John: *See—*
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Bousaid, Issam S.; and Fontaine, Marc F., to Texaco Inc. Process for recovering hydrocarbons from a subterranean reservoir by in situ combustion. 3,946,808, Cl. 166-245.000.

Bouyoucos, John V., to Hydroacoustics Inc. Acoustic transmitter. 3,946,831, Cl. 181-120.000.

Bowersmith, William R. Double pan utensil for baking cakes with water insulation held between the spaced apart side walls of the two pans. 3,946,893, Cl. 220-13.000.

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BPB Industries Limited: *See—*
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Bragg, Kenneth R., to Parker-Hannifin Corporation. Apparatus for transferring cryogenic liquid from one dewar to another. 3,946,572, Cl. 62-50.000.

Bralorne Resources Limited: *See—*
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Branigin, Charles D., to Ford Motor Company. Carburetor with controlled fast idle cam. 3,947,531, Cl. 261-39.00B.

Braun, Raymond E.; and Capozzoli, Joseph A. Gasoline nozzle assembly. 3,946,771, Cl. 141-59.000.

Bray, William Edward, to Texas Instruments Inc. Electronic variac surge current limiting circuit. 3,947,751, Cl. 323-9.000.

Breiter, Manfred Wolfgang; Mitoff, Stephan P.; and Powers, Robert W., to General Electric Company. Cell casing with a hermetic mechanical seal and a hermetically sealed sodium-sulfur cell. 3,946,751, Cl. 136-6.0FS.

Breitkreuz, Lutz, to Loewe-Opta GmbH. Pulsed flash tube regulator using thyristor gate control. 3,947,720, Cl. 315-151.000.

Brengdahl, David Sten Borje: *See—*
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Brenner, L. Martin; Petta, John M.; and Ross, Stephen T., to Smith-Kline Corporation. Substituted benzofurans and benzothiophenes. 3,947,470, Cl. 260-330.500.

Breth, Ralph Gilbert; Jenkins, James Robert; and Thole, James Arthur, to Federal Package Corporation. Corner pad. 3,946,874, Cl. 206-523.000.

Bretti, Franco: *See—*
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Brewer, Clifford Edmund. Rivetting machines. 3,946,925, Cl. 227-60.000.

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Briggs, James B., to Continental Engineering, Inc. Leakage current monitoring system and method. 3,947,759, Cl. 324-51.000.

Brilando, Frank P.; Heenan, Sidney A.; Schwinn, Rudolph L.; and Waxman, Jay S., to Schwinn Bicycle Company. Bicycle wheel reflector. 3,947,070, Cl. 301-37.0SA.

Brinkley, Max D.; and Griffiths, Robert I., to Goodyear Tire & Rubber Company, The. Tire building machine. 3,947,308, Cl. 156-133.000.

Brisbane, Alton W.: *See—*
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Broderick, Walter M. Article engaging and extracting arrangement for the removal of molded pieces from a molding machine. 3,947,208, Cl. 425-436.00R.

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Brooks, Eugene N., Jr.; and Ford, Allen G., to United States of America, Navy. Slantback, compliant surface effect vehicle skirt. 3,946,828, Cl. 180-128.000.

Brooks, Maurice E.; Riegel, Herbert; Schindler, Harvey D.; and Sze, Morgan C., to Lummus Company, The. Coupling process. 3,947,489, Cl. 260-488.00H.

Brouard, Claude Marie Henri Emile: *See*—
Pechmeze, Jacques Pierre Edmond; Sureau, Robert Frederic Michel; and Brouard, Claude Marie Henri Emile, 3,947,435.

Brouwer, Walter G.; MacPherson, Edwin J.; Ames, Ronald B.; Neidermyer, Robert W.; and Crittendon, Charles E., to Uniroyal, Inc.; and Uniroyal Ltd. Plant growth regulants. 3,947,263, Cl. 71-76.000.

Brown Brothers & Company Limited: *See*—
Stevenson, William David, 3,946,559.

Brown, Charles B., to United States of America, Navy. Direction finding system. 3,947,803, Cl. 340-6.00R.

Brown, David F. High performance golf tee. 3,947,027, Cl. 273-33.000.

Brown, David L. Reversible one way draw curtain rod. 3,946,791, Cl. 160-345.000.

Brown Equipment & Service Tools, Inc.: *See*—
Hipp, James Edward, 3,946,819.

Brown, Lyman J., to Bates Printing Specialties, Inc. Paperboard blank and carton. 3,946,936, Cl. 229-38.000.

Brown, Marshall S. B. Removable inboard rudder. 3,946,693, Cl. 114-165.000.

Browning Arms Company: *See*—
Lawrence, John S., 3,946,916.

Browning, Vernon D.: *See*—
Holden, Homer N.; Hunt, James P.; Browning, Vernon D.; Hoglen, Edward L.; and Kleykamp, Donald L., 3,946,483.

Brownlee, George Hunnam: *See*—
Osborn, Leroy Gordon; and Brownlee, George Hunnam, 3,947,101.

Bruderer, Werner; and Thiemann, Hans, to Schloemann Aktiengesellschaft; and concast AG. Method and apparatus for regulating the molten metal level in a mold of a continuous casting installation. 3,946,795, Cl. 164-154.000.

Brunell, Richard L.; and Wright, Jerry J., to Air Preheater Company, Inc., The. Recuperator. 3,946,801, Cl. 165-32.000.

Brunie, Jean Claude; Costantini, Michel; Crenne, Noel; and Jouffret, Michel, to Rhone-Poulenc S.A. Process for preparing omega-formyloxy-alkanals. 3,947,490, Cl. 260-488.00F.

Bube, Kenneth Roger, to RCA Corporation. Laser-trimmed resistor. 3,947,801, Cl. 338-308.000.

Buchan, Robert R. C.; and Kirchgessner, Robert W., Jr., to Buchan, Robert R. C. Audio-visual apparatus and method of using the apparatus for obtaining computer compatible data from an individual. 3,946,503, Cl. 35-9.00A.

Buchan, William A., to BASF Aktiengesellschaft. Method and circuit for detecting and compensating for drop-out and distortion of frequency modulated video signals. 3,947,873, Cl. 360-38.000.

Buchan, William Raymond; Kulpan, James A.; and Mayer, Edward Francis, to Itek Corporation. Electrophotographic toner transfer apparatus. 3,947,113, Cl. 355-3.00R.

Bucher, Hans R.: *See*—
Bamberg, Jack A.; Bucher, Hans R.; and Bultena, John G., 3,947,119.

Buchscheidt, Kurt, to Elbatainer Kunststoff-und Verpackungsgesellschaft mit beschrankter Haftung. Apparatus for fluid-tight welding of a closable connecting piece into a thin-walled container. 3,947,307, Cl. 156-73.100.

Bucyrus-Erie Company: *See*—
Nelmark, Jack D., 3,947,009.

Budich, Wolfgang, to Dynamit Nobel AG. Blind frame and sash constructions for sash windows, sliding doors, and the like. 3,946,524, Cl. 49-442.000.

Budway, Raymond J.; and McGlumphy, George F., to Westinghouse Air Brake Company. Retarder control system for automatic railroad classification yards. 3,946,973, Cl. 246-182.0BH.

Buffalo Forge Company: *See*—
Skold, Jan O.; and Kapoor, Virendra Nath, 3,947,532.

Buhk, Randall P., to Steelcase Inc. Chair. 3,947,068, Cl. 297-445.000.

Bull, Frederick W.; Leavitt, Richard A.; and Weiss, Robert L.; to International Business Machines Corporation. Magnetic recorder test article and methods. 3,947,875, Cl. 360-39.000.

Bultena, John G.: *See*—
Bamberg, Jack A.; Bucher, Hans R.; and Bultena, John G., 3,947,119.

Buntin, Robert R.; and Morgan, Walter A., to Exxon Research & Engineering Co. Battery separator manufacturing process. 3,947,537, Cl. 264-137.000.

Burckhardt, Manfred H.; Lutze, Walter; and Schwerdt, Paul, to Daimler-Benz Aktiengesellschaft. Frequency transmitter for signaling the slippage of vehicle wheels. 3,947,712, Cl. 310-168.000.

Burger, Erich, to Siemens Aktiengesellschaft. Circuit arrangement for demodulating a frequency-differential, phase-modulated signal. 3,947,633, Cl. 178-67.000.

Burger, Erich, to Siemens Aktiengesellschaft. Circuit arrangement for the demodulation of a phase-modulated signal. 3,947,777, Cl. 329-122.000.

Burkhard, Herbert; Hsu, Nelson Nae-Ching; and Fetter, Edward Joseph, to American Cyanamid Company. Emulsion polymerization of acrylate or other vinyl monomers using selected mixtures of soluble salts of certain sulfosuccinic acid half esters. 3,947,400, Cl. 260-29.6TA.

Burkhart, Gordon H.: *See*—
Rice, Robert R.; and Burkhart, Gordon H., 3,947,780.

Burroughs Corporation: *See*—
Cestrieres, Jacques; Condon, Christian; and Mouton, Bernard, 3,946,851.
Przybylek, George J., 3,947,713.

Burton, Parsons and Company, Inc.: *See*—
Rankin, Billy F., 3,947,573.

Burton, Victor A. C.: *See*—
Delves-Broughton, James; Burton, Victor A. C.; Kempster, Barry A.; and Williams, Thomas J., 3,947,343.

Busanovich, Charles John; Fischer, John Theodore; Moore, Robert Milton; and van Raalte, John A., to RCA Corporation. Photoconductor of cadmium selenide and aluminum oxide. 3,947,717, Cl. 313-386.000.

Bush Boake Allen Limited: *See*—
Jaggers, Brian George; Ufton, Keith Frederick; and Wagner, Horst Richard, 3,947,574.

Buslakova, Ljubov Pavlovna: *See*—
Baklanov, Nikolai Mikhailovich; Buslakova, Ljubov Pavlovna; Nekorystnova, Raisa Mikhailovna; Novikov, Anatoly Artemievich; Repenkova, Tatyana Grigorievna; Rumyantsev, Ivan Ivanovich; Sapogova, Galina Alexandrovna; Solodovnik, Nikolai Pavlovich; and Fridman, Viktor Mironovich, 3,947,262.

Butler, Robert C., to Raymond Lee Organization, Inc., The, a part interest. Suitcase device. 3,946,839, Cl. 190-18.00A.

Buttner-Schilde-Haas Aktiengesellschaft: *See*—
Schneider, Heinrich, 3,946,648.

Byers, David John, to New Zealand Inventions Development Authority. Waveform synthesis using switching circuits. 3,947,736, Cl. 318-227.000.

C. A. Sundberg AB: *See*—
Sundberg, Carl Axel, 3,947,233.

C. J. Kennedy Company: *See*—
Gray, Martin D., 3,947,876.

Caboni, Vittorio. Device to be applied to a lathe for spinning. 3,946,585, Cl. 72-83.000.

Cadiou, Jean, to Societe Anonyme Automobiles Citroen. Steering responsive control device for turning automotive headlamps. 3,947,680, Cl. 240-62.300.

Cadiou, Jean Georges, to Societe Anonyme Automobiles Citroen. Control unit for a vehicle and dashboard incorporating same. 3,946,827, Cl. 180-90.000.

Cairns, James: *See*—
Woods, Gilbert Frederick; Cairns, James; and McGarry, George, 3,947,478.

Cake, Arthur F., to Uranus Electronics, Inc. Electronic alarm watch. 3,946,549, Cl. 58-38.00R.

California Injection Molding Company, Inc.: *See*—
Carlson, Norris J., 3,946,595.

Calkins, Tracy H.; and Duckwall, Frank E., to Textron, Inc. Adjustable mold for direct casting of plastic multifocal lenses. 3,946,982, Cl. 249-102.000.

Calmes, Jean Paul, to Innocenti Santeustacchio S.p.A. Process and apparatus for rolling seamless tubes. 3,946,586, Cl. 72-201.000.

Cameron Iron Works, Inc.: *See*—
Meynier, Maurice J., III, 3,946,806.

Campagnuolo, Carl J.; and Curto, Paul A., to United States of America, Army. Mortar with variable vent for adjusting velocity of a single charge cartridge. 3,946,637, Cl. 89-1.00F.

Campbell, John Stewart; Davies, Phineas; and Richmond, John Russell, to Imperial Chemical Industries Limited. Method of making a catalyst. 3,947,381, Cl. 252-466.00B.

Campbell, Paul A. Apparatus and method for making a shingle. 3,946,633, Cl. 83-705.000.

Cannalonga, Marco Alfred; and Czarecki, Louis Vincent, to Hoffmann-La Roche Inc. Free-flowing, high density, agglomerated vitamin A powder compositions. 3,947,596, Cl. 424-344.000.

Cannon, Robert W.: *See*—
Cerny, Daryl D.; Cannon, Robert W.; Okeley, Robert E., II; and Sannella, Joseph L., 3,946,670.

Canon Kabushiki Kaisha: *See*—
Goshima, Takeshi; and Endo, Kiyonobu, 3,947,093.
Gushima, Hideki; Ito, Matsutoshi; and Ishiwata, Junichi, 3,947,753.
Ikemori, Keiji, 3,947,094.
Nakano, Toyomichi, 3,946,504.

Capozzoli, Joseph A.: *See*—
Braun, Raymond E.; and Capozzoli, Joseph A., 3,946,771.

Cardinal, Paul J., Jr., to Envirotech Corporation. Process of preparing sewage sludge for dewatering. 3,947,350, Cl. 210-10.000.

Caridis, Andrew A.; and Benson, Clark K., to Heat and Control, Inc. Food treatment apparatus and process. 3,947,241, Cl. 432-121.000.

Carlson, F. Paul; and Ward, Joseph E., III, to University of Washington, The Board of Regents of the. Coherent optical analyzer. 3,947,123, Cl. 356-39.000.

Carlson, Norris J., to California Injection Molding Company, Inc. Method and apparatus for testing mold vent orifices. 3,946,595, Cl. 73-37.000.

Carlson, Robert D., to Drake Manufacturing Company. Card reader. 3,947,666, Cl. 235-61.11E.

Carnahan, Robert D.; and Youtsey, Karl J., to Universal Oil Products Company. Duplex resistor inks. 3,947,277, Cl. 106-26.000.

Carnahan, Samuel U.; and Holman, James G., to United States of America, Navy. Thyratron limiter radar anti-jamming circuit. 3,947,846, Cl. 343-18.00E.

Carnahan, Samuel U.; and Longuemare, Robert N., Jr., to United States of America, Navy. Anti-jam dual channel video cancellation circuit for first target tracking system. 3,947,848, Cl. 343-18.00E.

Carnaud Total Interplastic: *See—*
Desjonqueres, Henry, 3,947,181.

Carney, William V.: *See—*
De Luca, Paul V.; Carney, William V.; and Fasano, Michael, 3,947,730.

Carondelet Foundry Company: *See—*
Culling, John H., 3,947,266.

Carpenter, L. Graydon: *See—*
Peterson, Richard W.; Carpenter, L. Graydon; and Kastelic, Raymond, 3,947,215.

Carroll, Gordon S., to International Telephone & Telegraph Corporation. Sound communication system. 3,947,694, Cl. 307-11.000.

Carter, William, to United Merchants and Manufacturers, Inc. Apparatus for treating textile fabric to retard inflammability. 3,946,497, Cl. 34-92.000.

Casa Herrera, Inc.: *See—*
Herrera, Frank J., 3,946,856.

Case, Brian J., to A. B. Dick Company. Dry toner dispenser assembly for copying machine. 3,946,910, Cl. 222-238.000.

Cash, Peter: *See—*
Barrett, Colin; and Cash, Peter, 3,946,500.

Casparian, Robert E.: *See—*
Greenfield, Charles; Casparian, Robert E.; and Bonanno, Anthony J., 3,947,327.

Cassada, Thomas Edward, to International Business Machines Corporation. Abstracting system for index search machine. 3,947,825, Cl. 340-172.500.

Cassella Farbwerke Mainkur AG: *See—*
Fleckenstein, Erwin; Heinrich, Ernst; and Mohr, Reinhard, 3,947,463.

Casset, Jacques G., to Strateurop S.A. Fishing rod having elastic ferrule connections. 3,947,141, Cl. 403-109.000.

Caterpillar Tractor Co.: *See—*
Berg, Lawrance F.; and Prillinger, Peter F. M., 3,947,077.
Guhl, Richard E.; and Sieving, Alfred W., 3,946,826.
Jeffrey, Charles Jerrold; Rust, Albert Edward; and Winslow, William Albert, 3,946,859.
Nelson, David V., 3,947,074.
Oldenburg, Dorrance; and Fischer, Robert L., 3,946,776.
Prillinger, Peter F. M.; and Rosenberger, Paul C., 3,946,898.

Cattaneo, Maurizio; Marchino, Armando; and Doano, Luigi, to Fiat Societa per Azioni. Device for reducing the braking effect of the engine of a motor vehicle equipped with an anti-skid braking system. 3,947,073, Cl. 303-21.00R.

Catterfeld, Fritz C., to Rockwell International Corporation. Integrated nozzle and steering mechanism for waterjets. 3,946,556, Cl. 60-221.000.

Cavanagh, John F.; Vaught, Dennis E.; and Wolfe, Hugh K., to United States of America, Navy. Broadband omnidirectional RF field intensity indicating device. 3,947,770, Cl. 325-363.000.

Caveney, Jack E.; Moody, Roy A.; Fulton, Ronald T.; and Rehling, Charles J., to Panduit Corporation. Automatic cable tie installation tool. 3,946,769, Cl. 140-93.200.

Celanese Corporation: *See—*
Dougherty, Edward F., 3,947,563.
Hobbs, Charles C.; and van't Hof, Hendrik A., 3,947,497.

Central Michigan University Board of Trustees: *See—*
Kohrman, Robert E.; and Phadtare, Pratap G., 3,947,247.

Cerny, Daryl D.; Cannon, Robert W.; Okeley, Robert E., II; and Sannella, Joseph L., to Ball Corporation. Apparatus for mounting and locking printing plates. 3,946,670, Cl. 101-378.000.

Cestrieres, Jacques; Condon, Christian; and Mouton, Bernard, to Burroughs Corporation. Electromagnetic assembly for actuating a stylus in a wire printer. 3,946,851, Cl. 197-1.00R.

Chadbourne, Barry O.; and Stoddard, William H., to United States of America, Navy. Hover control valve for submarine hovering system. 3,946,685, Cl. 114-16.00E.

Chadwick, Russell D. Load lifting system. 3,946,971, Cl. 244-137.00R.

Chaffers, John Michael, to Weyerhaeuser Company. Multi-ply panel with stacking tab. 3,946,934, Cl. 229-23.00R.

Chamaev, Viktor Nikolaevich: *See—*
Ryss, Jury Samuilovich; Bakhtin, Jury Grigorievich; Chamaev, Viktor Nikolaevich; and Panteleimonov, Vladimir Mikhailovich, 3,947,756.

Champ, Stanley G.: *See—*
Towne, Robin M.; and Champ, Stanley G., 3,946,598.

Champion International Corporation: *See—*
Solberg, Thomas M.; and Hamil, Donald W., 3,946,540.

Champion Spark Plug Company: *See—*
Nemeth, Joseph, 3,947,280.

Chan, Gaylord: *See—*
Hsiang-Lai, Wen; and Chan, Gaylord, 3,946,745.

Chao, Kwei C., to Standard Oil Company. Process for preparing high yields of single cell products having reduced purine content and high nutritive value. 3,947,605, Cl. 426-656.000.

Chapman, Charles Robert; and Schooler, James William. Control circuit. 3,947,733, Cl. 317-132.000.

Chappell, John R.: *See—*
Taylor, Walter F.; Rodgers, William G., Jr.; and Chappell, John R., 3,946,687.

Charlot, Gaston, to Societe Francaise D'Electrometallurgie. Process for treatment of pyrochlore concentrates. 3,947,542, Cl. 423-18.000.

Chavanoz S. A.: *See—*
Venot, Jean, 3,946,546.

Chavis, Julian B. Rotatable yarn winding spindle. 3,946,958, Cl. 242-46.300.

Cheek, Tom F., Jr.; and Barton, James B., to Texas Instruments Incorporated. Charge coupled device multiplexer. 3,947,698, Cl. 307-221.00D.

Chemtrust Industries Corporation: *See—*
Schneider, Barry L., 3,946,947.

Chen, Winston H.; and Lee, Ho C., to International Business Machines Corporation. Drop charging method for liquid drop recording. 3,947,851, Cl. 346-1.000.

Cherry, Richard Sutton, to Apollo-Dynamic Corporation Limited, The. Organic waste disposal device. 3,947,357, Cl. 210-170.000.

Chesley, Ronald F.: *See—*
Goldfarb, Adolph E.; Benkoe, Erwin; Everitt, Delmar K.; Chesley, Ronald F.; and Frierdich, Richard D., 3,946,517.

Chevaux, Jean. Floor for sports and in particular for roller skating. 3,946,529, Cl. 52-390.000.

Chevron Research Company: *See—*
Bacskai, Robert, 3,947,526.
Mitchell, David S., 3,947,347.
Parker, Phillip H., 3,947,310.

Chiba, Seiichi: *See—*
Ohshima, Iwao; Chiba, Seiichi; Ariyama, Kenzo; Ogawa, Yasuo; and Ozaki, Masahide, 3,947,518.

Chiba, Toyohiko: *See—*
Fujita, Teizo; Ohashi, Tosiro; and Chiba, Toyohiko, 3,947,789.

Chimura, Toshihiko, to Sony Corporation. Mode selecting device for tape recording and/or reproducing with releasable lock. 3,947,894, Cl. 360-137.000.

Chiriac, Ilie C.: *See—*
Teodorescu, Constantin Gh.; Chiriac, Ilie C.; Adam, Constantin I.; Diaconescu, Marin R.; Dragan, Nicolae T.; and Ber, Wilhelm F., 3,947,216.

Cho, Iwhan, to Uniroyal, Inc. Dinitro- and diamino arylene disulfones. 3,947,480, Cl. 260-397.600.

Chore-Time Equipment, Inc.: *See—*
Hostetler, Eldon, 3,946,701.

Christensen, Burton G.; and Ratcliffe, Ronald W., to Merck & Co., Inc. 3-α-Substituted cephalosporins. 3,947,413, Cl. 260-243.00C.

Christensen, Don Edward, to RCA Corporation. Channel number memory for television tuners. 3,947,773, Cl. 325-464.000.

Christenson, Rune. Method and apparatus for heat recovery. 3,946,802, Cl. 165-35.000.

Chrysler Corporation: *See—*
Portera, Vincent John, 3,946,574.

Chrysler United Kingdom Limited: *See—*
Holt, Paul, 3,947,148.

Chupka, David E.; Lehman, Donald F.; and Kohr, Gilbert E., to Black Clawson Company, The. Method of treating paper fibers in a stationary screen. 3,947,314, Cl. 162-55.000.

Ciba-Geigy AG: *See—*
Mausezahl, Dieter; and Wohlkonig, Alexander, 3,947,407.

Ciba-Geigy Corporation: *See—*
Gschwend, Heinz Werner, 3,947,585.
Meyer, Hans-Rudolf, 3,947,410.
Schmitter, Andre; Kiefer, Jurg; and Haug, Theobald, 3,947,385.
Schweizer, Ernst; Frei, Jorg; and Ilvespaa, Atso, 3,947,441.

Cincinnati Milacron, Inc.: *See—*
Kelly, Ralph; and Ritter, Edmond Jean, 3,947,382.
Parker, Peter Robert, 3,947,667.

Citizen Watch Company Limited: *See—*
Ichikawa, Shingo; and Yanagawa, Hiroshi, 3,946,592.
Yanagawa, Yoshihiko; and Yamaguchi, Shizuo, 3,946,591.

Clar, Milton, to Flinchbaugh Products, Inc. Apparatus for the compaction of refuse material and the like. 3,946,661, Cl. 100-53.000.

Clarion Co., Ltd.: *See—*
Yokota, Tadashi; Yanagi, Chiaki; and Hara, Toyoji, 3,947,884.

Clark Equipment Company: *See—*
Koch, Stanislaus H., 3,946,882.
Needles, Stanton D.; and Swanson, Allan R., 3,946,619.

Clarke, James A.; and Meth-Cohn, Otto, to Synthetic Chemicals Limited. Halogenation of heterocyclic compounds. 3,947,336, Cl. 204-158.0HA.

Clarke, James A.: *See—*
Shelley, Ralph R., Jr.; and Clarke, James A., 3,947,522.

Claudel S.A.: *See—*
Stenne, Pierre, 3,947,598.

Claussen, Uwe, to Bayer Aktiengesellschaft. Process for the manufacture of 2-aryl-vic-triazoles. 3,947,412, Cl. 260-240.00C.

Clayson N.V.: *See—*
Decoene, Frans J. G. C.; and Muijs, Cornelis G. M., 3,946,746.

Cleereman, Kenneth J.: *See—*
Ayres, Ralph E.; Cleereman, Kenneth J.; and Schrenk, Walter J., 3,947,204.

Clewell, Willard S., Jr.; and Friedman, Bernard, to Friedman, Bernard. Treatment of cooking oil. 3,947,602, Cl. 426-417.000.

Closures Industries Inc.: *See—*
Scuderi, Vincent, 3,946,890.

CMI Corporation: *See—*
Snow, Ralph K., Jr.; Grist, Warren W.; and Kruger, Joe Bill, 3,946,506.

Cobaugh, Robert Franklin; and Coller, James Ray, to AMP Incorporated. Apparatus for aligning and inserting pins into holes of a substrate. 3,946,477, Cl. 29-203.00B.

Cobb, Bernie J., to United States of America, Army. Low recoil anti-tank rocket launcher. 3,946,638, Cl. 89-1.806.
Cobb, Westray S. Cutting board. 3,947,012, Cl. 269-289.00R.
Cobb, William R., to White-Westinghouse Corporation. Cooking surface assembly for an induction range. 3,947,652, Cl. 219-10.790.
Coffey, Gerald P.: *See—*
Li, George S.; and Coffey, Gerald P., 3,947,527.
Cogliano, Joseph A., to W. R. Grace & Co. Collapsible plastic tubes. 3,946,905, Cl. 222-107.000.
Cole, Arthur L., Jr.: *See—*
Ball, Kenneth H.; and Cole, Arthur L., Jr., 3,947,741.
Colgate-Palmolive Company: *See—*
Fischer, Charles F., 3,947,200.
Pensak, Philip; and Januszewski, Joseph P., 3,947,570.
Colglazier, David E.: *See—*
Larson, Willis A.; and Colglazier, David E., 3,947,696.
Coller, James Ray: *See—*
Cobaugh, Robert Franklin; and Coller, James Ray, 3,946,477.
Collin, Per Harald; and Sundberg, Yngve, to Allmanna Svenska Elektriska Aktiebolaget. Furnace and method for reducing metal oxides to molten metal. 3,947,621, Cl. 13-23.000.
Columbia Machine, Inc.: *See—*
Schmitt, Robert A., 3,946,880.
Combustion Engineering, Inc.: *See—*
Hochmuth, Frank William, 3,946,566.
Commercial Solvents Corporation: *See—*
Egly, Richard S., 3,946,534.
Commonwealth of Australia, The: *See—*
Metcalfe, Kenneth Archibald; and Wilson, Clive Westgarth, 3,946,671.
Communications Technology Corporation: *See—*
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Compagnie Honeywell Bull: *See—*
Dalmasso, Ginette Laure, 3,947,821.
Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
Faugeras, Anne Marie; and Lambert, Andre, 3,947,805.
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Compagnie Internationale pour l'Informatique: *See—*
Lazzari, Jean-Pierre, 3,947,889.
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Conestoga Wood Products, Inc.: *See—*
Hahn, Norman; and Martin, Raymond G., 3,946,474.
Congoleum Industries, Inc.: *See—*
Haemer, Laurence F., 3,947,306.
Conklin, James T.: *See—*
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Conort Engineering AB: *See—*
Wallander, Bengt Olof Henrik, 3,946,442.
Continental Can Company, Inc.: *See—*
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Continental Engineering, Inc.: *See—*
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Contraves AG: *See—*
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Control Data Corporation: *See—*
Dahill, Edward Kevin; and Howes, Ronald Bruce, Jr., 3,947,881.
Procter, Samuel Anderson, 3,947,130.
Strom, Richard Albert; Mayer, William Norman; and Johnson, Robert Wallace, 3,947,722.
Cook Electric Company: *See—*
Cwirzen, Casimir, 3,947,732.
Cook, Robert W. Gas meter disconnect device. 3,946,754, Cl. 137-315.000.
Cooke, Charles Steven: *See—*
Petrasek, Stephen Edward; and Cooke, Charles Steven, 3,946,782.
Cooper, Adrianus A. G.; and Leopold, Phillip M., to Babcock & Wilcox Co., The. Graphite composite X-ray transparent patient support. 3,947,686, Cl. 250-439.000.
Copal Company Limited: *See—*
Inoue, Nobuyoshi; and Namioka, Kenta, 3,947,855.
Corkhill, David P.; and Freeman, Francis R., to Standard Oil Company. Automatic gain control for seismometer recorders. 3,947,806, Cl. 340-15.5GC.
Corning Glass Works: *See—*
Cotter, Douglas A.; and Rogers, Charles H., 3,947,121.
Cunningham, George M., 3,947,214.
Correia, Yves; and Lanet, Jean-Claude, to Rhone-Progil. Removal of HCl by distilling a vinyl chloride feed in solution with an alcohol. 3,947,508, Cl. 260-652.00P.
Cossement, Eric: *See—*
Ghosez, Leon; Cossement, Eric; and Biname, Robert, 3,947,469.
Costantini, Michel: *See—*
Brunie, Jean Claude; Costantini, Michel; Crenne, Noel; and Joufffret, Michel, 3,947,490.
Cotter, Douglas A.; and Rogers, Charles H., to Corning Glass Works. Method for aligning microstructures. 3,947,121, Cl. 356-38.000.
Cotterell, Jeffrey, to E. T. Marler Ltd. Drying apparatus. 3,946,501, Cl. 34-155.000.
Cottrell, Arnold George; and Paton, John Malloy, to Imperial Chemical Industries Limited. Solid fire-extinguishing compositions. 3,947,365, Cl. 252-5.000.
Coucher, Robert G.: *See—*
Gerek, Gene; and Coucher, Robert G., 3,947,617.
Coulter, Geoffrey Lionel: *See—*
Edwards, Reginald Harold; Coulter, Geoffrey Lionel; Dodd, Alan Michael; Kenney, Michael John; Bourne, Alan John; and Bird, David Alexander, 3,946,783.
Court, Patrick R. J., to Oak Industries Inc. Mechanical TV control unit. 3,947,787, Cl. 334-51.000.
Cowdrey, Roy Melvin; and Peets, Robert Seymour, to Singer Company - Patent Department, The. Swingaway convertible bed cabinets. 3,946,682, Cl. 112-217.100.
Cox, Percy T.; and Rundell, Herbert A., to Texaco Inc. Highly accurate odometer. 3,947,664, Cl. 235-92.0PL.
Crabtree, Ralph E. Register control punch. 3,946,632, Cl. 83-451.000.
Craford, Magnus George; and Bailey, Paul T., to Monsanto Company. Integrated semiconductor light-emitting display array. 3,947,840, Cl. 340-324.00M.
Crane Carrier Company: *See—*
Menkel, John P., Jr.; and Metz, Stewart N., 3,946,885.
Crane, Walton B., to A & E Plastik Pak Co., Inc. Garment hanger with clamp guard. 3,946,915, Cl. 223-96.000.
Crawford, Dennis M.; and Crawford, Murray G. Car-top boat carrier. 3,946,917, Cl. 224-42.10R.
Crawford, Murray G.: *See—*
Crawford, Dennis M.; and Crawford, Murray G., 3,946,917.
Creamer, Adelene B.: *See—*
Creamer, Marven; and Creamer, Adelene B., 3,946,458.
Creamer, Marven; and Creamer, Adelene B. Apparatus for collecting surface liquids. 3,946,458, Cl. 15-339.000.
Crenne, Noel: *See—*
Brunie, Jean Claude; Costantini, Michel; Crenne, Noel; and Joufffret, Michel, 3,947,490.
Creusot-Loire: *See—*
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Ruget, Gabriel, 3,946,593.
Crittendon, Charles E.: *See—*
Brouwer, Walter G.; MacPherson, Edwin J.; Ames, Ronald B.; Neidermyer, Robert W.; and Crittendon, Charles E., 3,947,263.
Cromeens, Jeff Y., to Industrial Woodworking Machine Co. Inc. Glue applicator. 3,946,700, Cl. 118-259.000.
Crooks, Graham Robert, to Imperial Chemical Industries Ltd. Manufacture of organic nitriles. 3,947,487, Cl. 260-465.300.
Crowder, John: *See—*
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Crutchley, Frank: *See—*
Lichtwardt, Harlow E.; Schrier, Bruce; Crutchley, Frank; and White, Thomas, 3,947,313.
CTS Corporation: *See—*
Van Benthuysen, John D.; and Flanders, Thomas W., 3,947,800.
Cuatrecasas, Pedro; and Parikh, Indu. Polysaccharide matrices for use as adsorbents in affinity chromatography techniques. 3,947,352, Cl. 210-31.00C.
Culling, John H., to Carondelet Foundry Company. Corrosion-resistant alloys. 3,947,266, Cl. 75-122.000.
Culpepper, Clifford, Jr., to Aero-Dyne Manufacturing, Inc. Ventilation apparatus and method. 3,946,650, Cl. 98-115.00K.
Cunningham, George M., to Corning Glass Works. Extrusion die mask. 3,947,214, Cl. 425-467.000.
Curto, Paul A.: *See—*
Campagnuolo, Carl J.; and Curto, Paul A., 3,946,637.
Cutler, John Frederick, to Wallace Murray Corporation. Intercooler fan and compressor construction. 3,946,565, Cl. 60-599.000.
Cwirzen, Casimir, to Cook Electric Company. Connector block for telephone central office main distributing frame. 3,947,732, Cl. 317-122.000.
Czarecki, Louis Vincent: *See—*
Cannalonga, Marco Alfred; and Czarecki, Louis Vincent, 3,947,596.
Daane, Robert A.; Beachler, Edward D.; Vonderau, Raymond C.; and Sokolow, Nickolas N., to Beloit Corporation. Parison oven having adjustable ceiling. 3,946,502, Cl. 34-231.000.
Dahill, Edward Kevin; and Howes, Ronald Bruce, Jr., to Control Data Corporation. Servo positioning error control for magnetic disk file. 3,947,881, Cl. 360-78.000.
Dahlin, Erik B.: *See—*
Al-Shaikh, Al; and Dahlin, Erik B., 3,947,668.
Dahlstrom, Robert V.: *See—*
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Dai Nippon Toryo Kabushiki Kaisha: *See—*
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Daicel Ltd.: *See—*
Hozumi, Yukio; Ohi, Akira; Toga, Yuzo; Yoshizaki, Hiroyuki; Takanohashi, Hiromitsu; and Masuda, Yoshitaka, 3,947,524.
Daimler-Benz AG: *See—*
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Daimler-Benz Aktiengesellschaft: *See—*
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Dalgleish, Jack F.: *See—*
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Dalmasso, Ginette Laure, to Compagnie Honeywell Bull. Microprogramming apparatus and method. 3,947,821, Cl. 340-172.500.

Dana, Alfred, III. Shoe with detachable illuminated heel. 3,946,505, Cl. 36-2.50K.

Dana Corporation: *See—*
Gray, Larry O., 3,946,707.

Danforth, Donald W., to Bolton-Emerson, Inc. Attrition pulper having high level thrust for grinding pulp and refining fibres. 3,946,951, Cl. 241-21.000.

Danfoss A/S: *See—*
Engberg, Lorenz Asmus, 3,946,983.

Daniels, William L., Sr., to B. F. Goodrich Company, The. Fail-safe disc brake. 3,946,838, Cl. 188-170.000.

Daubach, Ewald: *See—*
Belde, Horst; Oppenlaender, Knut; Daubach, Ewald; and Fikentscher, Rolf, 3,947,287.

Daute, Otto, to Licentia Patent-Verwaltungs-GmbH. Circuit for stabilizing the operating voltage of a sweep circuit for a cathode-ray tube. 3,947,755, Cl. 323-43.50S.

Dautremont, Joseph L., Jr.; and Schneider, William J., to Whittaker Corporation. Digital storage system for high frequency signals. 3,947,827, Cl. 340-173.0RC.

Davies, Phineas: *See—*
Campbell, John Stewart; Davies, Phineas; and Richmond, John Russell, 3,947,381.

Davis, Albert Roy, to BioMagnetics, International Inc. Magnetic field expansion and compression method. 3,947,533, Cl. 264-24.000.

Davy-Loewy Ltd.: *See—*
Maltby, Jack, 3,946,587.

Davydova, Alexandra Fedorovna: *See—*
Andrianov, Kuzma Andrianovich; Gandurin, Lev Ivanovich; Davydova, Alexandra Fedorovna; and Sidorov, Vyacheslav Ivanovich, 3,947,366.

Dayco Corporation: *See—*
Holden, Homer N.; Hunt, James P.; Browning, Vernon D.; Hoglen, Edward L.; and Kleykamp, Donald L., 3,946,483.

Deane, Graham: *See—*
Bentley, George; and Deane, Graham, 3,946,445.

DeBaun, Jack R.; Pallos, Ferenc M.; and Baker, Don R., to Stauffer Chemical Company. 5-Furoyl-2,2,4-trimethyl-1,4-dihydro-1H-1,5-benzodiazepine as an anti-inflammatory agent. 3,947,475, Cl. 260-347.300.

de Boer, Gerard Arnold; and de Hes, Max, to N.V. Neratoom. Nuclear reactor plants and control systems therefor. 3,947,319, Cl. 176-65.000.

DeCecco, Angelo L.; Demarest, Donald M.; Piccone, Dante E.; and Somos, Istvan, to General Electric Co. Reverse voltage surge protection for high-voltage thyristors. 3,947,726, Cl. 317-16.000.

Decicom Systems, Inc.: *See—*
Goldstein, Amnon, 3,947,691.

Decker, Robert W., to Ingersoll-Rand Company. Vapor stripping and recovery method and apparatus. 3,947,258, Cl. 55-88.000.

Decoene, Frans J. G. C.; and Muijs, Cornelis G. M., to Clayson N.V. Harvesting machines. 3,946,746, Cl. 130-27.00P.

Dedrick, Robert L.; Lutz, Robert J.; and Zaharko, Daniel S., to United States of America, State. Apparatus for controlling the release of a drug. 3,946,734, Cl. 128-260.000.

DeGraauw, Henk Anthony; and Bashyam, Ramaswami, to Northern Electric Company Limited. Method of providing dialtone first on step by step telephone systems. 3,947,643, Cl. 179-6.30R.

de Hes, Max: *See—*
de Boer, Gerard Arnold; and de Hes, Max, 3,947,319.

Deletzke, Norman E. H., Jr. Hub for a reel of recording tape. 3,946,962, Cl. 242-68.300.

DeLigt, John; and Talbert, David F., to Westvaco Corporation. Corrugating apparatus. 3,947,206, Cl. 425-388.000.

Dell Holdings Limited: *See—*
Elias, Murray A., 3,946,992.

Deltrol Corporation: *See—*
Harris, John L., 3,947,790.

De Luca, Paul V.; Carney, William V.; and Fasano, Michael, to Porta Systems Corporation. Telephone line surge protecting device. 3,947,730, Cl. 317-61.500.

Delves-Broughton, James; Burton, Victor A. C.; Kempster, Barry A.; and Williams, Thomas J., to International Standard Electric Corporation. Electrotinning wire. 3,947,343, Cl. 204-207.000.

De Marco, Fortunato: *See—*
Morelli, Morello; and De Marco, Fortunato, 3,947,510.

Demarest, Donald M.: *See—*
DeCecco, Angelo L.; Demarest, Donald M.; Piccone, Dante E.; and Somos, Istvan, 3,947,726.

Denki Kagaku Kogyo K.K.: *See—*
Horiie, Shigeki; Kurematsu, Susumu; Asai, Shinichiro; and Saito, Chiaki, 3,947,536.

Denny, Clifford M.; Naylor, Hugh E., III; and Williams, Thomas H., to International Business Machines Corporation. Subscripting, superscripting, and character height compression in ink jet printing apparatus. 3,947,853, Cl. 346-75.000.

Denny, Robert Bruce: *See—*
Rousos, William Nicholas; and Denny, Robert Bruce, 3,947,769.

d'Entremont, John C.; and Taylor, Charles R., to Armco Steel Corporation. Process for making stainless steel. 3,947,267, Cl. 75-130.500.

Depoisson, Jean Pierre: *See—*
Sutter, Jean Georges; and Depoisson, Jean Pierre, 3,946,986.

de Putter, Warner Jan, to Wavin B.V. Extruder drive. 3,947,000, Cl. 259-192.000.

Deribie, Pierre Henri; and Lavaux, Jean-Paul, to Roussel Uclaf. Omega-[4-(3''-indolyl)-piperidino]-alkyl-arylketones as nevroleptics. 3,947,578, Cl. 424-267.000.

De Sandre, Giovanni; Subrizi, Angelo; and Bretti, Franco, to Ing. C. Olivetti & C., S.p.A. Magnetic card writing and reading device. 3,947,663, Cl. 235-61.11D.

Desblache, Andre E.; and Stern, Thomas E., to International Business Machines Corporation. Carrier-modulation data transmission equalizers. 3,947,768, Cl. 325-42.000.

de Schilde, D. van de Werve: *See—*
Leroux, Pierre J.; and de Schilde, D. van de Werve, 3,947,305.

Designs For Vision, Inc.: *See—*
Feinbloom, Richard E., 3,947,139.

Desjonqueres, Henry, to Carnaud Total Interplastic. Tool assembly. 3,947,181, Cl. 425-242.00B.

DeSoto, Inc.: *See—*
Sekmakas, Kazys, 3,947,399.

de Tullio, Luigi: *See—*
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Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.v.: *See—*
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Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Asinger, Friedrich; and Offermanns, Heribert, 3,947,464.
Geiger, Friedhelm; Heimberger, Werner; and Schreyer, Gerd, 3,947,552.
Rocktaschel, Gottfried; Thurn, Friedrich; Fleischhauer, Horst; Schwarze, Werner; and Westlinning, Hermann, 3,947,436.

Dewaele, Daniel Camille Cornelius, to Lamson Paragon Limited; and Dirk Strobbe PVBA, Firma. Photocomposing machines. 3,947,116, Cl. 355-40.000.

DeWall, Richard A. Medical drainage device. 3,946,735, Cl. 128-278.000.

Dey, Arabinda; N.; and Sullivan, Bernard P., to P. R. Mallory & Co., Inc. Mixed solvents for high and low temperature organic electrolyte batteries. 3,947,289, Cl. 136-6.0LN.

Diaconescu, Marin R.: *See—*
Teodorescu, Constantin Gh.; Chiriac, Ilie C.; Adam, Constantin I.; Diaconescu, Marin R.; Dragan, Nicolae T.; and Ber, Wilhelm F., 3,947,216.

Diamond Shamrock Corporation: *See—*
Lasco, Ralph H., 3,947,521.

Diantonio, Daniel Joseph, to Litton Systems Inc. Self-captivating keeper for idler rolls. 3,946,858, Cl. 198-192.00R.

Diehl, Joseph O.; Germano, Carl A.; Mason, Lawrence D.; and Veres, David R., to Motorola, Inc. Automated electrical resistivity measuring apparatus for semiconductor crystal rods. 3,947,765, Cl. 324-158.00R.

Dienes, Zoltan B., to Communications Technology Corporation. Apparatus for use in applying an expandable resilient sleeve to a member therein. 3,946,480, Cl. 29-235.000.

Dietmann, Karl: *See—*
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Dietz, Gerald Edward, to Johnson Service Company. Fuel ignition control arrangement. 3,947,220, Cl. 431-80.000.

Di Giulio, John H.: *See—*
Miller, Frank R.; Andreiko, Craig A.; and Di Giulio, John H., 3,946,488.

Di Grasso, Leonard, to Kelsey-Hayes Company. Adjustable die for coldwelding machine. 3,946,928, Cl. 228-3.100.

Dinelli, Dino; Bartoli, Francesco; and Gulinelli, Silvio, to Snamprogetti S.p.A. Preparation of high permeability cellulose fibers containing enzymes. 3,947,325, Cl. 195-68.000.

Dirk Strobbe PVBA, Firma: *See—*
Dewaele, Daniel Camille Cornelius, 3,947,116.

Doane, William M.: *See—*
Swanson, Charles L.; Wing, Robert E.; and Doane, William M., 3,947,354.

Doano, Luigi: *See—*
Cattaneo, Maurizio; Marchino, Armando; and Doano, Luigi, 3,947,073.

Dr. Carl Hahn GmbH: *See—*
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Dr. Ing. h.c.F. Porsche Aktiengesellschaft: *See—*
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Dodd, Alan Michael: *See—*
Edwards, Reginald Harold; Coulter, Geoffrey Lionel; Dodd, Alan Michael; Kenney, Michael John; Bourne, Alan John; and Bird, David Alexander, 3,946,783.

Doehle, Lothar A.; Drescher, Heinz; Lampe, Hans H.; Pohle, Werner; and Rudolph, Peter, to International Business Machines Corporation. Priority control circuit. 3,947,824, Cl. 340-172.500.

Dohse, Jurgen; and Klucker, Klaus, to O & K Orenstein & Koppel Aktiengesellschaft. Tracklaying vehicle comprising four tracklaying units. 3,946,822, Cl. 180-9.460.

Dolinar, William E.: *See—*
Petermann, James P.; Dolinar, William E.; and Ehrlich, Stanley V., 3,947,014.

Donnelly, Donald E.; McElroy, Jerry W.; and Ehlmann, Arlie H., to Emerson Electric Co. Transformer winding means and methods. 3,947,795, Cl. 336-184.000.

Dormann, Gunter: *See—*
Schulde, Felix; Obendorf, Johann; Neubold, Kurt; and Dormann, Gunter, 3,947,384.

Dorn, Conrad P., Jr.: *See—*
Shen, Tsung-Ying; Li, Jorge P.; and Dorn, Conrad P., Jr., 3,947,582.

Dorner, Heinrich; and Michel, Eberhard, to Siemens Aktiengesellschaft. Reactor pressure vessel support arrangement. 3,947,322, Cl. 176-87.000.

Dougherty, Edward F., to Celanese Corporation. Hydrogenolysis of formates. 3,947,563, Cl. 423-636.000.

Dougherty, Timothy Stephen, to Western Electric Company, Inc. Apparatus for extruding concentric plastic sheaths. 3,947,173, Cl. 425-113.000.

Douthwaite, Clifford; Pugh, Stuart; and Semeneko, Ivan, to USM Corporation. Screen printing machines. 3,946,668, Cl. 101-123.000.

Dow Chemical Company, The: *See—*
Ayres, Ralph E.; Cleereman, Kenneth J.; and Schrenk, Walter J., 3,947,204.
Baggett, Joseph M., 3,947,383.
Hradel, Joseph R.; and Staadt, Harold E., 3,947,301.
Johnston, Howard, 3,947,437.
Jones, Giffin D., 3,947,427.
Kangas, Donald A.; and Neuendorf, W. Robert, 3,947,396.
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Powers, J. Bruce, 3,947,248.
Priddy, Duane B., 3,947,418.
Shelley, Ralph R., Jr.; and Clarke, James A., 3,947,522.
Tatum, Sammy Duane; and Hawkins, Jerry Marvin, 3,947,422.

Dow Chemical (Nederland) B.V.: *See—*
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Downs, David C. Mechanical torque transmitting device. 3,946,843, Cl. 192-45.100.

Doyle, Edward J.: *See—*
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Drackett Company, The: *See—*
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Dracon Industries: *See—*
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Dragan, Nicolae T.: *See—*
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Drake Manufacturing Company: *See—*
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Dravo Corporation: *See—*
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Drawsky, Ronald H., to Kaiser Aluminum & Chemical Corporation. Ventilation system for food stuffs. 3,946,649, Cl. 98-56.000.

Dreher, Karl: *See—*
Gotze, Christian; Fleck, Adolf; Dreher, Karl; and Heidrich, Gunther, 3,946,922.

Drescher, Heinz: *See—*
Doehle, Lothar A.; Drescher, Heinz; Lampe, Hans H.; Pohle, Werner; and Rudolph, Peter, 3,947,824.

Dresser Industries, Inc.: *See—*
Pate, Oscar Glenn; and Lyons, Angus Loughlin, Jr., 3,946,571.

Driessen, Fransiscus M.; Stadhouders, Jacobus J.; and Ubbels, Jacob, to Stiching Bedrijven Van Het Nederlands Instituut Voor Zuivelonderzoek. Process for the continuous preparation of yogurt and other fermented milk products. 3,946,657, Cl. 99-455.000.

DuBose, Reagan L., Jr., to Hycor, Incorporated. Dimension measuring module. 3,946,492, Cl. 33-169.00R.

DuBrueler, Ralph, Jr. Automatic liquid dispensing system. 3,946,900, Cl. 222-20.000.

Duckwall, Frank E.: *See—*
Calkins, Tracy H.; and Duckwall, Frank E., 3,946,982.

Duffek, Edward F.; Funk, Ernest J.; Jankowski, Alfred S.; Lane, Jack C.; Lehner, William L.; Oliver, Floyd F.; and Schneider, Mark R., to Signetics Corporation. Two part package for a semiconductor die. 3,947,867, Cl. 357-70.000.

Duinker, Hans Dignus; and Wijnen, Jan Francis Cornelis Maria, to U. S. Philips Corporation. Method of manufacturing an electrically conducting layer on an internal wall part of a cathode-ray tube. 3,947,608, Cl. 427-64.000.

Dunlop Limited: *See—*
Edwards, Reginald Harold; Coulter, Geoffrey Lionel; Dodd, Alan Michael; Kenney, Michael John; Bourne, Alan John; and Bird, David Alexander, 3,946,783.
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Du Pont de Nemours, E. I., and Company: *See—*
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Durckheimer, Walter; Raether, Wolfgang; and Seliger, Hubert Georg, to Hoechst Aktiengesellschaft. Tetrahydroacridones having chemotherapeutic action and process for preparing them. 3,947,449, Cl. 260-279.00R.

Dynamit Nobel AG: *See—*
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Dynamit Nobel Aktiengesellschaft: *See—*
Vollkommer, Norbert; and Behr, Erich, 3,947,402.

Dynastor, Inc.: *See—*
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E. R. Squibb & Sons, Inc.: *See—*
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E-Systems, Inc.: *See—*
Gershberg, David N.; Lee, Alex Y.; and Parker, Clair F., Jr., 3,947,834.

E. T. Marler Ltd.: *See—*
Cotterell, Jeffrey, 3,946,501.

Eary, George D., Sr. Adjustable head and shoulder rest. 3,946,452, Cl. 5-327.00B.

Eastman Kodak Company: *See—*
Miller, Howard A., 3,947,370.
Travot, Guy Claude Daniel; and Sirand-Rey, Gerard Rene, 3,947,890.

Eastman Technology, Inc.: *See—*
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Eaton Corporation: *See—*
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Ebisutani, Junichi: *See—*
Sagawa, Seiji; Nakagawa, Tsunehiko; Yoshida, Osamu; Mori, Kenjiro; and Ebisutani, Junichi, 3,947,429.

Echols, Marvin; and Stockton, Ralph H. Cleaning device for tubes. 3,946,455, Cl. 15-104.06R.

Eckardt, Helmut, to Schloemann-Siemag Aktiengesellschaft. Apparatus for injection molding of multi-layer bodies of thermoplastic. 3,947,177, Cl. 425-130.000.

Eckell, Wolfgang: *See—*
Bechstein, Herbert; Biebl, Herbert; Eckell, Wolfgang; Franz, Anton; Hofmann, Eberhard; Stauch, Hans; Staudt, Heinrich; Tomasch, Hellmut; Urlberger, Alois; and Winnewisser, Theodor, 3,946,590.

Eckert, Konrad; and Stumpp, Gerhard, to Robert Bosch GmbH. Fuel injection system. 3,946,714, Cl. 123-139.0AW.

Eckstein, Royal W., Jr., to United States of America, Navy. Automatic target detection system. 3,947,833, Cl. 340-258.00R.

Ecodyne Corporation: *See—*
Tischler, Edward J., 3,946,753.

Edgar, Albert D. Transient noise filter employing crosscorrelation to detect noise and autocorrelation to replace the noisey segment. 3,947,636, Cl. 179-1.00P.

Edwards, Bryant, to Illinois Tool Works Inc. Apparatus for forming non-nestable containers. 3,947,205, Cl. 425-387.00B.

Edwards, Henry: *See—*
Bagg, Greville Euan Gordon; Edwards, Henry; Evans, Michael Ernest Newcombe; Lewis, John Arnold; and Ziebland, Hans, 3,947,535.

Edwards, Reginald Harold; Coulter, Geoffrey Lionel; Dodd, Alan Michael; Kenney, Michael John; Bourne, Alan John; and Bird, David Alexander, to Dunlop Limited. Pneumatic tires. 3,946,783, Cl. 152-330.00L.

Edwards, Robert Harry; Williams, Thomas Alan; and Hall, Kenneth, to Albright & Wilson Limited. Phosphoric acid purification. 3,947,499, Cl. 260-614.00R.

Edwards, Thomas A.: *See—*
Sale, Ernest W.; Edwards, Thomas A.; and Hodges, John W., 3,947,261.

Ege, Hans, to Underwriters Safety Device Co. Quick-connect-disconnect terminal block assembly. 3,947,080, Cl. 339-64.00M.

Egger, Hermann, to Quepor S.A. Sterilizing device for web shaped packaging material. 3,947,249, Cl. 21-92.000.

Egly, Richard S., to Commercial Solvents Corporation. Process of blanketing with inert gas. 3,946,534, Cl. 53-22.00R.

Ehlebracht, Horst; and Philipp, Albert, to Richard Heinze GmbH & Co. KG, Firma. Adjustable suspension for attaching pieces of furniture to a wall. 3,946,979, Cl. 248-274.000.

Ehlmann, Arlie H.: *See—*
Donnelly, Donald E.; McElroy, Jerry W.; and Ehlmann, Arlie H., 3,947,795.

Ehrlich, Stanley V.: *See—*
Petermann, James P.; Dolinar, William E.; and Ehrlich, Stanley V., 3,947,014.

Eibl, Heinz: *See—*
Hatz, Gottfried; and Eibl, Heinz, 3,946,712.

Eibl, Johannes; Wolf, Karlheinz; and Prochaska, Helmut, to Bayer Aktiengesellschaft. Process for producing spotted dyeings with pastes containing water-soluble resin or wax and particulate dyestuff. 3,947,246, Cl. 8-62.000.

Ek, Klas Goran Gunnarsson, to Atlas Copco Aktiebolag. Dust controlling device for rock drilling. 3,946,818, Cl. 175-209.000.

Elbataimer Kunststoff-und Verpackungsgesellschaft mit beschrankter Haftung: *See—*
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Tensmeyer, Lowell G., 3,947,415.
Verge, John Pomfret; Neville, Martin Charles; and Friedman, Henry, 3,947,467.
Elias, Murray A., to Dell Holdings Limited. Construction fence post. 3,946,992, Cl. 256-68.000.
Elliott, Barry. Counterweighted mechanical boom. 3,947,144, Cl. 408-235.000.
Ellis, Eugene. Extensible vehicle bumper. 3,947,061, Cl. 293-5.000.
Ellwood, Henry, to USM Corporation. Extruder and roll die apparatus. 3,947,201, Cl. 425-147.000.
Elmeg Elektro-Mechanik GmbH: *See—*
Reuting, Hans-Werner, 3,947,792.
Emerson Electric Co.: *See—*
Donnelly, Donald E.; McElroy, Jerry W.; and Ehlmann, Arlie H., 3,947,795.
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Emil Pester, Platinen-u. Apparatefabrik, Firma: *See—*
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Emmons, Stephen Perry, to Texas Instruments Inc. Method and system for achieving and sampling programmable tap weights in charge coupled devices. 3,947,705, Cl. 307-304.000.
Endo, Kiyonobu: *See—*
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Engberg, Lorenz Asmus, to Danfoss A/S. Valve with a closing member actuated by way of a diaphragm. 3,946,983, Cl. 251-61.200.
Engeriser, Charles. Power embossing apparatus. 3,946,663, Cl. 101-3.00R.
England, Will Clarke. Fuel vaporizer with centrifugal-venturi liquid droplet feedback. 3,946,717, Cl. 123-141.000.
Enoguchi, Yuji: *See—*
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Epaneshnikova, Valentina Evgenievna; Kondratskaya, Evgenia Alexandrovna; Primak, Grigory Karpovich; Umantsev, Viktor Sergeevich; and Okun, Svetlana Alexandrovna. Printed resistor. 3,947,799, Cl. 338-9.000.
EPPCO: *See—*
Gerek, Gene; and Coucher, Robert G., 3,947,617.
Erapa AG: *See—*
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Eriksson, Erik, to Sepson AB. Vehicle winch. 3,946,991, Cl. 254-166.000.
Ermolaev, Viktor Sergeevich: *See—*
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Kaes, Hans-Herbert, 3,947,282.
Ernst, Richard J., to Xerox Corporation. Binding strip feed terminator. 3,946,919, Cl. 226-11.000.
Eross, Bela. Endotracheal tube holder. 3,946,742, Cl. 128-351.000.
Ershler, Samuel H. Multipurpose foldable electric stove. 3,947,657, Cl. 219-454.000.
Ershova, Tatyana Ivanovna: *See—*
Tikhonova, Vera Viktorovna; Markov, Alexandr Ivanovich; Gerasimova, Marina Andreevna; Zhukova, Galina Ivanovna; Altman, Morits Borisovich; Timonova, Margarita Alexandrovna; Ershova, Tatyana Ivanovna; Krysin, Boris Trofimovich; Kitari-Oglu, Georgy Gerasimovich; Morozova, Galina Ivanovna; and Lashko, Nikolai Fedorovich, 3,947,268.
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Eshelman, Raymond H., to Oravisual Company, Inc. Paper pad clamping fixture. 3,947,138, Cl. 402-69.000.
Eskenas, Joel L. Push button electrical combination ignition lock. 3,947,693, Cl. 307-10.0AT.
Essilor International "Compagnie Generale d'Optique": *See—*
Paget, Pierre Charles, 3,947,098.
Esteve-Subirana, Antonio, to Laboratorios Del Dr. Esteve SA. Salts of novel p-dihydroxybenezene disulfonic acids. 3,947,448, Cl. 260-268.00R.
Etani, Kenji. Filter with an open-celled elastomer foam. 3,947,362, Cl. 210-416.000.
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Evans, Donald J., to Molins Machine Company, Inc. Preheater and method of controlling wrap of a web. 3,946,800, Cl. 165-1.000.
Evans, Herbert W., to United States of America, Energy Research and Development Administration. Protective air lock. 3,946,645, Cl. 98-1.500.
Evans, Michael Ernest Newcombe: *See—*
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Evans, Philip Henry, to Glenburn Engineering (U.K.) Limited. Record players. 3,947,042, Cl. 274-9.00A.
Evans, Philip Henry, to Glenburn Engineering (U.K.) Limited. Record-splayers. 3,947,043, Cl. 274-10.00R.
Evans, William D., to Raymond Lee Organization, Inc., The, a part interest. Curtain rod mounting device. 3,946,978, Cl. 248-264.000.
Everitt, Delmar K.: *See—*
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Fairbairn, Thomas E., to Sirius Corporation. Method of spray coating using laser-energy beam. 3,947,653, Cl. 219-76.000.
Fairbairn, Thomas E., to Sirius Corporation. Method of generating laser-radio beam. 3,947,654, Cl. 219-121.0LM.
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Fast Heat Element Manufacturing Co., Inc.: *See—*
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Fast, Sven Gunnar, to Sandco Limited. Environment protective oil skimming and removal apparatus. 3,947,360, Cl. 210-242.00S.
Faugeras, Anne Marie; and Lambert, Andre, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Device for determining the direction of a plane wave. 3,947,805, Cl. 340-6.00R.
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Fehlner, Leo F.; Jerardi, Thomas W.; and Roll, Ronald G., to Johns Hopkins University, The. Loran receiver-navigator. 3,947,849, Cl. 343-103.000.
Fehrs, Hellmuth, to Behrens, Joh. Friedrich. Magazine for fastener-driving apparatus. 3,946,927, Cl. 227-126.000.
Feinbloom, Richard E., to Designs For Vision, Inc. Light sources employing universally adjustable ball and socket joints. 3,947,139, Cl. 403-90.000.
Feins, Irvin Ralph, to American Cyanamid Company. Process for reducing nitrogen oxides by treating catalyst support and a metal nitrate with urea and thereafter calcining. 3,947,379, Cl. 252-463.000.
Felauer, Ethel E.: *See—*
Graham, Bruce A.; Puttock, Michael A.; Felauer, Ethel E.; and Neidermyer, Robert W., 3,947,264.
Feldkamper, Richard, to Windmoller & Holscher. Apparatus for spreading open cross-bottoms on tubular members. 3,946,644, Cl. 93-28.000.
Felsen, Marvin J.: *See—*
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Felsenthal, Harry D., Jr., to United States of America, Navy. Radar system. 3,947,847, Cl. 343-18.00E.
Fenstermacher, Thomas E., to United States of America, Air Force. Collimated x-ray source for x-ray lithographic system. 3,947,687, Cl. 250-492.00A.
Fergg, Berthold; Zahn, Wolfgang; and Hujer, Friedrich, to AGFA-Gevaert AG. Label for use on containers for photographic film or the like. 3,946,507, Cl. 40-2.00R.
Ferrentino, Antonio, to Industrie Pirelli Societa per Azioni. Method and apparatus for joining a flexible waveguide to another element. 3,947,785, Cl. 333-98.00R.
Fetter, Edward Joseph: *See—*
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Evgenievich; Filatov, Andrei Dmitrievich; and Galkin, Dmitry Prokhorovich, 3,947,344.
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Petrasek, Stephen Edward; and Cooke, Charles Steven, 3,946,782.
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Fischer, Adolf; Koenig, Karl-Heinz; and Kolbinger, Rudolf, to BASF Aktiengesellschaft. Carbothiolates. 3,947,485, Cl. 260-455.00A.
Fischer, Artur. Chain having detachable links and buckets. 3,946,515, Cl. 46-17.000.
Fischer, Charles F., to Colgate-Palmolive Company. Apparatus for producing striated soap bars. 3,947,200, Cl. 425-131.100.
Fischer, John Theodore: *See—*
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Fischer, Otto H.; and Schoenke, Donald F., to Stowell Industries, Inc. Label remover for bottle washing machine. 3,946,750, Cl. 134-104.000.
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Fitchmun, Douglas R., to Ford Motor Company. Method of making a silicon carbide article of less than full density. 3,947,550, Cl. 423-345.000.
Flad, Hermann, to Balzers Patent- und Beteiligungs AG. Optical arrangement for illuminating an object with the light of a sharply limited spectral region of the radiation of a luminous source. 3,947,092, Cl. 350-171.000.
Flament, Ivon: *See—*
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Fleckenstein, Erwin; Heinrich, Ernst; and Mohr, Reinhard, to Cassella Farbwerke Mainkur AG. Certain 2-amino-nicotinonitrile derivatives. 3,947,463, Cl. 260-294.80G.
Fleischhauer, Horst: *See—*
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Forbes, Hampton E., Jr.; and Breylinger, George, to Westvaco Corporation. Easy opening carton. 3,946,937, Cl. 229-51.0TC.
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Fort, Pierre Henri Marie; and Pierrel, Michel, to Pont-a-Mousson S.A. Machine for centrifugally casting iron pipes. 3,946,799, Cl. 164-286.000.
Foster, Donald. Decorative candle and method of manufacture therefor. 3,947,232, Cl. 431-288.000.
Fowler, Larry G., to Sugar Cane Growers Cooperative of Florida. Field operated cane cleaning apparatus. 3,946,875, Cl. 209-115.000.
Fowler, Reginald H.: *See—*
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Fox, Joseph. Finger tip writing instrument. 3,947,132, Cl. 401-7.000.
Fox, Terrence S., to Lenox Candles, Inc. Mechanical expander for elastic molds. 3,947,209, Cl. 425-440.000.
Fraioli, Joseph, Sr. Conveyor belt system including straight line and curved sections. 3,946,857, Cl. 198-189.000.
Frank, Alan I. W. Molding apparatus. 3,946,981, Cl. 249-79.000.
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Frankfurt, Sandor. Tobacco filter for smoking articles. 3,946,748, Cl. 131-261.00R.
Frankman, Charles W. Integrated stereo speaker system. 3,947,635, Cl. 179-1.00E.
Franz, Anton: *See—*
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Fraser, Donald L., Jr.; and Perger, Bruce, to United States of America, Army. Field emission tip and process for making same. 3,947,716, Cl. 313-336.000.
Frech, Louis W.; Hubble, David H.; and Zook, Lewis J., to United States Steel Corporation. Method of burning-in lining in bottom blown steelmaking furnace. 3,947,002, Cl. 266-43.000.
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Freeman, Francis R.: *See—*
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Freeman, Harlan G.; Gillern, Maurice F.; and Smith, Harry A., to Weyerhaeuser Company. Rapid curing, hydrophilic resin compositions. 3,947,425, Cl. 260-51.500.
Freeman, Robert M., to Metal Marine Pilot, Inc. Autopilot employing improved hall-effect direction sensor. 3,946,691, Cl. 114-144.00E.
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French, Park, to Weber Dental Manufacturing Co. Interface for light probe. 3,947,088, Cl. 350-96.00C.
Frenger, Karl Gunnar. Box- or channel shaped lighting fixture for liquid cooling. 3,947,679, Cl. 240-47.000.
Freydier, Pierre Henry, to S.E.F.I. Sondages-Etanchements-Forages-Injections. Support and foundation composite pile for various works and method for manufacturing the same. 3,946,570, Cl. 61-53.520.
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Frischbier, Klaus, to Linde Aktiengesellschaft. Thermodynamically improved system for producing gaseous oxygen and gaseous nitrogen. 3,947,259, Cl. 62-13.000.
Fritsch, Rudolf Paul. Apparatus for use in processing molten plastics. 3,947,195, Cl. 425-190.000.
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Fujita, Kinji, to Kabushiki Kaisha Suwa Seikosha. Quartz crystal timepiece. 3,946,550, Cl. 58-50.00R.
Fujita, Teizo; Ohashi, Tosiro; and Chiba, Toyohiko, to Izumi Denki Company Limited. Motor timer. 3,947,789, Cl. 335-74.000.
Fujita, Tomomitsu; and Imai, Yoshiaki, to Tokico Ltd. Valve device for gases. 3,946,985, Cl. 251-130.000.
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Fukuda, Yoshiharu; and Ueda, Yoshihiko, to Onoda Cement Co., Ltd. Method and apparatus for dispersing powered material in a combustion chamber. 3,947,238, Cl. 432-14.000.
Fulenwider, John E., to GTE Laboratories Incorporated. Apparatus for and method of converting from a digital signal to an acoustic wave using a piezoelectric beam. 3,947,708, Cl. 310-8.100.
Fuller, Maurice D., to Korry Manufacturing Company. Electrical cartridge with interchangeable circuitry for the cap. 3,947,651, Cl. 200-314.000.
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Fuxe, Kjell, to Nelson Research & Development Company. Method and composition for potentiating neuroleptic drugs. 3,947,579, Cl. 424-267.000.
Fyler, Norman F., to Stanley Works, The. Electronic personnel safety sensor. 3,947,734, Cl. 317-146.000.
G.A.O. Gesellschaft fur Automation und Organisation m.b.H.: *See—*
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G & S Industries, Inc.: *See—*
Seliga, Gerald W., 3,946,513.
Gach, Peter P., to Sunbeam Plastics Corporation. Tamper indicating child resistant closure. 3,946,889, Cl. 215-219.000.
GAF Corporation: *See—*
Randall, David L., 3,947,594.
Gage, Lonnie L. Oil well pump with resilient plunger cup means. 3,947,158, Cl. 417-554.000.
Gail, Josef, to Maschinenfabrik Fahr AG. Automatic steering system for standing-crop harvester. 3,946,825, Cl. 180-79.20R.
Gajer, Israel; Licht, Theodore; and Goodman, Harold, to Jameco Industries, Inc. Collapse-resistant paperbox packaging. 3,946,870, Cl. 206-471.000.
Gale, Walter W.; Ashcraft, Thomas L., Jr.; and Saunders, Rhoderick K., to Exxon Production Research Company. Use of materials as waterflood additives. 3,946,812, Cl. 166-274.000.
Gali Mallofre, Salvador. Screen processing machines. 3,946,667, Cl. 101-123.000.
Galicia, Virgil Rene. Clip-type holder for toothbrushes or the like. 3,946,877, Cl. 211-65.000.
Galkin, Dmitry Prokhorovich: *See—*
Golikov, Nikolai Sergeevich; Berlin, Boris Iosifovich; Popov, Boris Evgenievich; Filatov, Andrei Dmitrievich; and Galkin, Dmitry Prokhorovich, 3,947,344.
Gall, Martin; and Hester, Jackson B., Jr., to Upjohn Company, The. Intermediates and process for the production of certain triazolobenzodiazepines. 3,947,466, Cl. 260-308.00R.
Gallagher, Peter Christopher John, to N L Industries, Inc. Low density cast racquet. 3,947,029, Cl. 273-73.00D.
Galster, Hans: *See—*
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Garcia, Antonio Lorenzo. Improvements introduced into machines for breaking and stretching textile fibers. 3,946,462, Cl. 19-.410.
Garcia, Joel H. Broiler. 3,946,651, Cl. 99-444.000.
Gardner, James Dennis: *See—*
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Garkusha, Ivan Semenovich: *See—*
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Garman, Burdette Mallory. Quick-detachable archery quiver. 3,946,718, Cl. 124-30.00R.
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Gassner, Johann, Jr. Dust-repelling apparatus. 3,946,646, Cl. 98-2.000.
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Geiger, Erich, to Loewe-Opta GmbH. Variable-frequency sweep generator circuit. 3,947,724, Cl. 315-410.000.
Geiger, Friedhelm; Heimberger, Werner; and Schreyer, Gerd, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the purification of cyanogen chloride. 3,947,552, Cl. 423-379.000.
Geiger, Robert G., to Air-Flo Company, Inc. Air deflector for use in combination with a vehicle pulling a trailer. 3,947,065, Cl. 296-1.00S.
General Dynamics Corporation: *See—*
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Genevieve I. Hanscom, Robert Magnuson, Louis J. Thomson (formerly Lois J. Duggan), as Trustees of Estate of Roy M. Magnuson: *See—*
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Geng, Hellmuth Roland; Hajdu, Johann; and Knauft, Guenter, to International Business Machines Corporation. Binary parallel computing arrangement for additions or subtractions. 3,947,671, Cl. 235-175.000.
Gengnagel, Kurt; Papenfuhs, Theodor; and Zimmermann, Manfred, to Hoechst Aktiengesellschaft. Process for the manufacture of aromatic sulfonic acid halides. 3,947,512, Cl. 260-543.00R.
George, Peter K., to Rockwell International Corporation. Complementary transition structures for magnetic domain propagation. 3,947,830, Cl. 340-174.0TF.
Georgia Pacific Corporation: *See—*
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Gerek, Gene; and Coucher, Robert G., to EPPCO. Coated container. 3,947,617, Cl. 428-35.000.
Gergely, Gerhard, to Barmag Barmer Maschinenfabrik Aktiengesellschaft. Mixing and granulating apparatus. 3,946,996, Cl. 259-10.000.
Germano, Carl A.: *See*—
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Gershberg, David N.; Lee, Alex Y.; and Parker, Clair F., Jr., to E-Systems, Inc. Doppler perimeter intrusion alarm system using a leaky waveguide. 3,947,834, Cl. 340-258.00A.
Ghosez, Leon; Cossement, Eric; and Biname, Robert, to Recherche et Industrie Therapeutiques (R.I.T.). 3-(1,3-Dithian-2-yl)-4-cyclopentene-2-carboxylic acids, esters and amides. 3,947,469, Cl. 260-327.00M.
Gibson, Geoffrey Moorhouse; and Crowder, John. Alkali metal dithionite manufacture. 3,947,559, Cl. 423-515.000.
Gifford-Hill & Company, Inc.: *See*—
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Giger, Robert John; and Lawrence, James Michael, to RCA Corporation. Start-up power supply for a television receiver. 3,947,632, Cl. 178-7.500.
Gilb, Tyrell T., to Simpson Manufacturing Company, Inc. Truss structure with fastener plate joint assembly. 3,946,532, Cl. 52-692.000.
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Giller, Solomon Aronovich; Zhuk, Regina Abramovna; Berzinya, Anna Eduardovna; and Sherinya, Laima Avgustovna. Process for producing N_1-(Dihydroxyalkyl)-5-substituted uracils. 3,947,444, Cl. 260-260.000.
Gillern, Maurice F.: *See*—
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Gillilan, Robert Lewis, Jr. Mounting bracket for bicycle safety flag. 3,947,059, Cl. 280-289.000.
Givaudan Corporation: *See*—
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Wild, Jost; and Huber, Ulrich, 3,947,405.
Glamkowski, Edward J., to American Hoechst Corporation. 5H-aminoacetamido-10,11-dihydrodibenz-[b,f]azepines and immediate precursors. 3,947,447, Cl. 260-268.0TR.
Glasband, Hyman S.: *See*—
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Glasband, Norman; and Glasband, Hyman S. Frame box. 3,946,863, Cl. 206-216.000.
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Goede, Philip J., to Atlantic Research Corporation. Process for simulating turbojet engine plumes. 3,946,555, Cl. 60-207.000.
Goldberg, Kenneth M. Credit card verifier. 3,947,820, Cl. 340-149.00A.
Goldfarb, Adolph E.; Benkoe, Erwin; Everitt, Delmar K.; Chesley, Ronald F.; and Frierdich, Richard D., to Goldfarb, Adolph E.; and Benkoe, Erwin. Animal characterization figures with articulatable body components. 3,946,517, Cl. 46-21.000.
Goldfarb, Adolph E.; and Benkoe, Erwin. Magnetic doll set with thin substrate supported by a frame and by walls thereon. 3,946,520, Cl. 46-240.000.
Goldfarb, Adolph E.; and Benkoe, Erwin. Toy bowling game. 3,947,028, Cl. 273-41.000.
Goldfarb, Adolph E.; Benkoe, Erwin; and Merino, Dennis H., to Goldfarb, Adolph E.; and Benkoe, Erwin. Toy game of chance and skill. 3,947,030, Cl. 273-85.00R.
Goldfarb, Adolph E.; and Benkoe, Erwin. Competitive toy basketball game. 3,947,031, Cl. 273-85.00C.
Goldman, Irving M.: *See*—
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Goldstein, Amnon, to Decicom Systems, Inc. Optical embossing reader. 3,947,691, Cl. 250-566.000.
Golikov, Nikolai Sergeevich; Berlin, Boris Iosifovich; Popov, Boris Evgenievich; Filatov, Andrei Dmitrievich; and Galkin, Dmitry Prokhorovich. Inert anode. 3,947,344, Cl. 204-286.000.
Goller, Werner F.; Luckenbach, Helge F.; and Fritsch, Rudolf Paul. Apparatus for filtering molten plastics and for extruding plastic strands. 3,947,202, Cl. 425-185.000.
Goman, Vyacheslav Grigorievich: *See*—
Bark, Semen Efimovich; Garkusha, Ivan Semenovich; Kafyrin, Jury Pavlovich; Kreinin, Efim Vulfovich; Fedorov, Nikolai Ananievich; Shulyak, Vladimir Fedorovich; Khaitin, Alexandr Alexandrovich; Alexandrov, Sergei Gavrilovich; Bobrov, Marat Mikhailovich; Goman, Vyacheslav Grigorievich; Ermolaev, Viktor Sergeevich; Leonov, Sergei Vladimirovich; and Mikheev, Vikenty Pavlovich, 3,946,719.
Gomez, I. Luis, to Monsanto Company. Compounding nitrile polymers to reduce the extractable HCN with a formaldehyde compound. 3,947,431, Cl. 260-85.0SS.
Gonzalez, John; and Munz, Robert P., to Lincoln Electric Company, The. Cored type electrode welding. 3,947,655, Cl. 219-146.000.
Goodman, Harold: *See*—
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Goodsmith, Dale H.; and Ladouceur, Harold A., to Multifastener Corporation. Fastener installation head. 3,946,479, Cl. 29-208.00D.
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Gordon, Frank John, to Motorola, Inc. Support structure for pushbutton radio tuner assembly. 3,947,786, Cl. 334-7.000.
Gorin, Sylvan. Dispensing spoon. 3,946,652, Cl. 99-323.000.
Gornstein, Robert J.; and Meldahl, Kenneth R., to Boeing Company, The. Hydrodynamic sections. 3,946,688, Cl. 114-66.50H.
Goshima, Takeshi; and Endo, Kiyonobu, to Canon Kabushiki Kaisha. Optical device for producing a minute light beam. 3,947,093, Cl. 350-189.000.
Gotaverken Angteknik AB: *See*—
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Gotze, Christian; Fleck, Adolf; Dreher, Karl; and Heidrich, Gunther, to AGFA-Gevaert AG. Photographic copying machine. 3,946,922, Cl. 226-91.000.
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Graat, Johannes W.; Pelser, Johannes C. H.; and Hoornenborg, Bart C., to Smit Nijmegan B.V. Process and apparatus for the production of inert gas. 3,947,217, Cl. 431-12.000.
Grace, Michael H.; and Karazija, Arvin, to Allis-Chalmers Corporation. Electric truck having elevated load potential energy recovery with means to adjust rate of carriage descent. 3,947,744, Cl. 320-61.000.
Graf, Carl R., to Pennsylvania Crusher Corporation. Material reducer. 3,946,950, Cl. 241-18.000.
Graham, Bruce A.; Puttock, Michael A.; Felauer, Ethel E.; and Neidermyer, Robert W., to Uniroyal, Inc.; and Uniroyal Ltd. Substituted 2,3-dihydro-,4-oxathiin plant growth stunting agents. 3,947,264, Cl. 71-76.000.
Grandine, Joseph D.; Marsh, Nat H.; and Snyder, James E., to Millipore Corporation. Apparatus for electrophoresis migration. 3,947,345, Cl. 204-299.00R.
Graneau, Peter, to Massachusetts Institute of Technology. Vacuum insulated A-C superconducting cables. 3,947,622, Cl. 174-15.00S.
Granger, James Peter; Hirst, Kenneth; and Whitehead, David Montagu, to British Petroleum Company Limited, The. Burners. 3,947,227, Cl. 431-118.000.
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Gray, George William; and Harrison, Kenneth John, to Secretary of State for Defence in Her Britannic Majesty's Govt. of U.K. of Gt. Britain and Northern Ireland. Liquid crystal materials and devices. 3,947,375, Cl. 252-299.000.
Gray, Larry O., to Dana Corporation. Electronic vehicle speed control. 3,946,707, Cl. 123-102.000.
Gray, Martin D., to C. J. Kennedy Company. Dual density 800 bpi NRZI and 1600 bpi PE read circuit for a digital magnetic tape transport. 3,947,876, Cl. 360-40.000.
Gray, Thomas J.: *See*—
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Green, Edwin J. Underground irrigation system. 3,946,762, Cl. 138-140.000.
Green, Lane A., to Superior Iron Works & Supply Company, Inc. Bull wheel. 3,946,618, Cl. 74-230.500.
Greenfield, Charles; Casparian, Robert E.; and Bonanno, Anthony J., to Hanover Research Corporation. Process and apparatus for recovering clean water from aqueous wastes. 3,947,327, Cl. 203-7.000.
Greer Hydraulics, Inc.: *See*—
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Grenzebach, Hans. Agitator for nonhomogeneous, liquid materials in a tank. 3,946,997, Cl. 259-45.000.
Greve, Peter Ferdinand, to U.S. Philips Corporation. Electrically controlled radial mass shifting elements for turntable speed regulation in an apparatus for reading disc-shaped information carriers. 3,947,625, Cl. 178-6.6DD.
Grey, Frederick R., to Omark Industries, Inc. Toggle bolt. 3,946,636, Cl. 85-3.00S.
Griefahn, Hans-Joachim, to Stanzwerk Peitz & Co. Chair. 3,947,067, Cl. 297-84.000.

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Grimshaw, Rex William; and Peacey, John Gilleran, to Hepworth & Grandage Limited. Production of a form of alumina whiskers. 3,947,562, Cl. 423-630.000.

Griner, Arthur J.; and Koppa, Daniel Anthony, to Nabisco, Inc. Apparatus for making pastry cups and the like. 3,947,212, Cl. 425-451.900.

Grist, Warren W.: *See—*
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Groenendaal, Willem; Kock, Heinz-Gerhard A.; and Loof, Philippus, to Shell Oil Company. Process for reducing total sulfur content of claus off-gases. 3,947,547, Cl. 423-242.000.

Grolman, Bernard; and Lavallee, Robert G., to American Optical Corporation. Solid state color anomaloscope. 3,947,099, Cl. 351-35.000.

Grossman, Jack J., to McDonnell Douglas Corporation. Method of producing a spectral line rejection mirror. 3,947,302, Cl. 156-3.000.

Grosz, Hanus J., to Indiana University Foundation. Treatment of opiate addiction. 3,947,592, Cl. 424-330.000.

Grottrup, Helmut; Hoppe, Joachim; and Haghiri, Yahya, to G.A.O. Gesellschaft fur Automation und Organisation m.b.H. Transparent package. 3,946,869, Cl. 206-466.000.

Grube, Donald B.; Grube, Juan C.; and Grube, James A. Voltage regulator tester. 3,947,757, Cl. 324-28.00R.

Grube, James A.: *See—*
Grube, Donald B.; Grube, Juan C.; and Grube, James A., 3,947,757.

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Grundy, Reed H., to Westinghouse Air Brake Company. Simplified cab signal receiver circuit. 3,946,972, Cl. 246-34.0CT.

Gruss, George A., to General Electric Company. Electrically heated transparent panel. 3,947,618, Cl. 428-49.000.

Gschwend, Heinz Werner, to Ciba-Geigy Corporation. Pyrazolobenzazepines. 3,947,585, Cl. 424-273.000.

GTE Laboratories Incorporated: *See—*
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GTE Sylvania Incorporated: *See—*
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Guenther, Ludwig; Welzel, Guenter; and Janausche, Rainer, to VEB Wirkmaschinenbau Karl-Marx-Stadt. Mechanism for feeding the shuttles into the weaving cylinder of an automatic wave shed loom. 3,946,765, Cl. 139-12.000.

Guhl, Richard E.; and Sieving, Alfred W., to Caterpillar Tractor Co. Vehicle dash assembly. 3,946,826, Cl. 180-90.000.

Gulf Research & Development Company: *See—*
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Gulinelli, Silvio: *See—*
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Gulla, Michael, to Shipley Company, Inc. Printed circuit drill. 3,947,143, Cl. 408-230.000.

Gunjima, Tomoki: *See—*
Asawa, Tatsuro; and Gunjima, Tomoki, 3,947,351.

Gushima, Hideki; Ito, Matsutoshi; and Ishiwata, Junichi, to Canon Kabushiki Kaisha. Voltage regulator including an LED to provide a reference voltage. 3,947,753, Cl. 323-21.000.

Guthlein, Werner: *See—*
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Gutjahr, Paul; Luthi, Hans; and Wasser, Rene, to Erapa AG. Device for positioning overlapping ends of a looped band in a working area of an automatic packaging machine. 3,946,659, Cl. 100-4.000.

Gutleber, Frank S., to International Telephone and Telegraph Corporation. Code generator to produce permutations of code mates. 3,947,674, Cl. 235-181.000.

Gutmann, Walter: *See—*
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Guzowski, Matthew M.; Bishop, E. Dennis; and Setzer, William C., to Swiss Aluminium Limited. Process of adding alloy ingredients to molten metal. 3,947,265, Cl. 75-10.00R.

Haas, Werner E. L.; Adams, James E.; and Richter, Bela, to Xerox Corporation. Liquid crystal display system. 3,947,183, Cl. 350-160.0LC.

Hackbarth, Eugene R.; Miller, George E.; Petersen, H. Norman; Sheldon, John D.; and Ward, Harry M., III, to Outboard Marine Corporation. Engine exhaust gas discharge arrangement. 3,946,697, Cl. 115-.50E.

Haemer, Laurence F., to Congoleum Industries, Inc. Method for producing bonded carpeting. 3,947,306, Cl. 156-72.000.

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Hagedorn, Alton R., to Exxon Production Research Company. Oil recovery by combination steam stimulation and electrical heating. 3,946,809, Cl. 166-248.000.

Hagen, Wilhelm: *See—*
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Hahn, Erich; and Reissig, Frank, to VEB Pentacon Dresden. Device for document filming. 3,947,112, Cl. 355-68.000.

Hahn, Norman; and Martin, Raymond G., to Conestoga Wood Products, Inc. Rotary cutting head. 3,946,474, Cl. 29-105.00R.

Hai, Harry Wong Hon, to Winner Food Products Limited. Manufacture of filled pastry rolls. 3,946,656, Cl. 99-450.600.

Hair, George R.; and Agostinelli, Albert, to New Jersey Electronic Co. Apparatus for forming and closing a display package. 3,946,537, Cl. 53-184.000.

Hajdu, Johann: *See—*
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Halcon International, Inc.: *See—*
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Kollar, John, 3,947,501.

Hall, Herbert Charles. Folding luggage carrier. 3,947,054, Cl. 280-36.00C.

Hall, Kenneth: *See—*
Edwards, Robert Harry; Williams, Thomas Alan; and Hall, Kenneth, 3,947,499.

Hall, Mitchell A., to Monarch Tool & Manufacturing Company. Coinchute for testing the ferrous content, weight, and presence of an aperture in coins. 3,946,849, Cl. 194-97.00B.

Hall, Robert P., Sr., to Arvin Industries, Inc. Recording cassette including compliant magnetic recording disc having flexible support means. 3,947,893, Cl. 360-133.000.

Hall, Walter L.; and Webb, Jimmy L., to General Electric Company. Production of dibenzopyrans, their isomeric fluorenols and dibenzothiopyrans. 3,947,468, Cl. 260-327.0TH.

Halpern, Alfred: *See—*
Kelly, William, deceased; Kelly, Monica, representative; Kelly, John, representative; and Halpern, Alfred, 3,947,491.

Hamaguchi, Hiroshi; and Tanaka, Atsuyuki, to Minolta Camera Kabushiki Kaisha. Illumination means for use in photocopying machine. 3,947,106, Cl. 355-1.000.

Hamaguchi, Hiroshi, to Minolta Camera Kabushiki Kaisha. Optical illumination device for use in copying machine. 3,947,115, Cl. 355-8.000.

Hamamoto, Nobuo: *See—*
Watanabe, Kazuo; and Hamamoto, Nobuo, 3,947,822.

Hamil, Donald W.: *See—*
Solberg, Thomas M.; and Hamil, Donald W., 3,946,540.

Han, Jin Suk. Moxibustion apparatus. 3,946,733, Cl. 128-254.000.

Hanna, Kim L., to Hewlett-Packard Company. Ventilator patient monitor. 3,946,729, Cl. 128-145.800.

Hanover Research Corporation: *See—*
Greenfield, Charles; Casparian, Robert E.; and Bonanno, Anthony J., 3,947,327.

Hansel, William B., to Sun Oil Company of Pennsylvania. Automatic dispensing nozzle adapted for vapor recovery. 3,946,773, Cl. 141-206.000.

Hansel, William P., to Sun Oil Company of Pennsylvania. Filling arrangements for fluid storage containers. 3,946,758, Cl. 137-590.000.

Hansen, James E.; and Jackson, James L., to Gifford-Hill & Company, Inc. Self propelled sprinkling irrigation apparatus. 3,946,946, Cl. 239-177.000.

Hansen, Raymond J.; St. Jacques, Gerald A.; and Whitely, Robert M., to NCR Corporation. Thermal printer systems. 3,947,854, Cl. 346-76.00R.

Hanson Industries Inc.: *See—*
Larson, Richard A., 3,947,052.

Hara, Toshitaka: *See—*
Kobayashi, Yoshiki; Bandoh, Tadaaki; and Hara, Toshitaka, 3,947,818.

Hara, Toyoji: *See—*
Yokota, Tadashi; Yanagi, Chiaki; and Hara, Toyoji, 3,947,884.

Harding Development Co.: *See—*
Hawk, Gary D., 3,947,135.

Harding, William E.: *See—*
Aronstein, Jesse; and Harding, William E., 3,946,484.

Harms, Engelbert Gerhard: *See—*
Menges, Hans George Ludwig; Harms, Engelbert Gerhard; and Lehnen, Josef Peter, 3,946,998.

Harper, John Ford. Automatic buffing machine. 3,946,525, Cl. 51-76.00R.

Harren, Hugh H.: *See—*
Albano, Joseph L.; and Harren, Hugh H., 3,946,710.
Harris, John L., to Deltrol Corporation. Automatic reset timer. 3,947,790, Cl. 335-75.000.
Harrison, Ian T.: *See—*
Fried, John H.; and Harrison, Ian T., 3,947,472.
Harrison, Kenneth John: *See—*
Gray, George William; and Harrison, Kenneth John, 3,947,375.
Harrison, Raymond E.; Kiss, Marvin L.; and Ott, Douglas E., to International Telephone and Telegraph Corporation. Digital delay line correlator. 3,947,672, Cl. 235-181.000.
Harshaw Chemical Company, The: *See—*
Moss, Robert H.; and Spicuzza, William F., 3,947,553.
Hartinger, Edmund: *See—*
Bodmer, Maurice; Hartinger, Edmund; and Huber, Albert, 3,947,610.
Hartman, William H.; Mietz, Raymond E.; Peschke, John R.; and Ruge, Donald H., to American Can Company. Method of extruding bark and of forming a solid synthetic fuel. 3,947,255, Cl. 44-10.00H.
Hasegawa, Satoshi. Board game apparatus. 3,947,037, Cl. 273-131.00D.
Hashimoto, Mitsuo; Kawakami, Nobuo; Nakagawa, Kazuhiko; and Fujieda, Yasuhiko, to Bridgestone Tire Company, Ltd.; and Kobe Steel, Ltd. Method for curing tires, especially large-size tires. 3,947,540, Cl. 264-326.000.
Hatano, Akira: *See—*
Miyazaki, Ken; Kubota, Narumi; Igarashi, Kooichi; Sato, Hiroshi; Takahashi, Kazutoshi; Maki, Takeshi; Hatano, Akira; and Kai, Masamitsu, 3,946,625.
Hato, Kuniki, to Nobutoshi Ohuchi. Crusher for breaking discarded glass articles into gem-like granules. 3,946,953, Cl. 241-79.200.
Hattori, Kyo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Cooling system of an internal combustion engine incorporating a by-pass flow control system. 3,946,943, Cl. 236-34.500.
Hattori, Masayuki: *See—*
Kanbara, Kenjiro; Hattori, Masayuki; and Yoda, Jihei, 3,947,234.
Hatz, Gottfried; and Eibl, Heinz, to Motorengabrik Hatz KG. Injection internal combustion engine. 3,946,712, Cl. 123-139.0AF.
Haug, Theobald: *See—*
Schmitter, Andre; Kiefer, Jurg; and Haug, Theobald, 3,947,385.
Hauni-Werke Korber & Co. KG: *See—*
Schwenke, Dieter, 3,946,643.
Hawk, Gary D., to Harding Development Co. Paint tray. 3,947,135, Cl. 401-121.000.
Hawkins, David B.: *See—*
Robinson, Harold R., 3,946,886.
Hawkins, Edwin George Edward, to BP Chemicals (U.K.) Limited. Process for the production of lactams. 3,947,406, Cl. 260-239.30A.
Hawkins, Jerry Marvin: *See—*
Tatum, Sammy Duane; and Hawkins, Jerry Marvin, 3,947,422.
Hayakawa, Kiyonori: *See—*
Saito, Makoto; Matsumoto, Kengo; and Hayakawa, Kiyonori, 3,947,891.
Hayashi, Haruhisa: *See—*
Sato, Masaki; and Hayashi, Haruhisa, 3,947,658.
Hayashi, Katsuhiko: *See—*
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Hayashi, Takumi: *See—*
Kimura, Isamu; and Hayashi, Takumi, 3,947,749.
Hayes, George A., to United States of America, Navy. Pyrophoris penetrator. 3,946,673, Cl. 102-52.000.
Hazeldine, David John: *See—*
Jones, Kenneth Wood; and Hazeldine, David John, 3,947,285.
Heat and Control, Inc.: *See—*
Caridis, Andrew A.; and Benson, Clark K., 3,947,241.
Hebda, Thomas. Device for assisting the opening of a door. 3,946,523, Cl. 49-38.000.
Hecht, Robert F.; and Perdue, Stanley. Apparatus having moveable pocket forming members for injection molding a composite plate. 3,947,199, Cl. 425-127.000.
Heenan, Sidney A.: *See—*
Brilando, Frank P.; Heenan, Sidney A.; Schwinn, Rudolph L.; and Waxman, Jay S., 3,947,070.
Heidenberger, Guenter J., to Roli Chemical, Ltd. Method of electrodeposition. 3,947,330, Cl. 204-17.000.
Heidenreich & Harbeck, Zweigneiderlassung der Gildemeister AG: *See—*
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Heidrich, Gunther: *See—*
Gotze, Christian; Fleck, Adolf; Dreher, Karl; and Heidrich, Gunther, 3,946,922.
Heien, Sigurd. Offshore oil production platform. 3,946,568, Cl. 61-46.500.
Heimberger, Werner: *See—*
Geiger, Friedhelm; Heimberger, Werner; and Schreyer, Gerd, 3,947,552.
Heimbrand, Eberhard, to Ledermann & Co. Edge machining tool construction. 3,946,777, Cl. 144-90.00A.
Heinicke, Harald, to Siemens Aktiengesellschaft. Single-ended dc-to-dc converter for the pulse control of the voltage at an inductive load as well as method for its operation. 3,947,746, Cl. 321-2.000.
Heinig, Richard H., to Bear Brand Hosiery Co. One-piece panty and method of manufacture. 3,946,579, Cl. 66-177.000.
Heinrich, Ernst: *See—*
Fleckenstein, Erwin; Heinrich, Ernst; and Mohr, Reinhard, 3,947,463.
Heitzer, Robert; and Klenk, Peter, to Kunststoffwerk Gebruder Anger GmbH & Co. Apparatus for controlling temperature of an extruder screw. 3,946,803, Cl. 165-87.000.
Helmlinger, Daniel; and Naegeli, Peter, to Givaudan Corporation. 1-Halo-dodeca-tri(tetra)-ene. 3,947,505, Cl. 260-654.00R.
Heminger, Clarke E.: *See—*
Huntington, Keith D.; and Heminger, Clarke E., 3,946,602.
Hempelmann, Willi: *See—*
Jarchow, Friedrich G. K.; Haensel, Dietrich; Hempelmann, Willi; Sturmath, Rainer; Ringleben, Hans; and Knabel, Walter, 3,947,311.
Henley, Virgil E., to General Tire and Rubber Company, The. Apparatus for making pneumatic tires torically with an annular guide assembly. 3,947,312, Cl. 156-415.000.
Hennemann, Jean, to UNELEC. Locking device having low control power for an electrical device. 3,947,791, Cl. 335-167.000.
Hennings, Klaus: *See—*
Schutze, Hans-Jurgen; and Hennings, Klaus, 3,947,869.
Hennrich, Helmuth: *See—*
Magidson, Herbert; Huber, Otto L.; and Hennrich, Helmuth, 3,947,207.
Henricot, Paul E., to Societe Anonyme Usines Emile Henricot. Suspension devices of side members on axle-boxes for railway carriages and similar applications. 3,946,677, Cl. 105-224.100.
Henriquez, Theodore A.: *See—*
Tims, Allan C.; and Henriquez, Theodore A., 3,947,802.
Henry, David W.; and Sturm, Priscilla A., to Stanford Research Institute. Diazabicyclooctanes and diazabicycloheptanes. 3,947,445, Cl. 260-268.0BF.
Hepworth & Grandage Limited: *See—*
Grimshaw, Rex William; and Peacey, John Gilleran, 3,947,562.
Herbert Tang, Wing-Hing. Fluorescent lantern. 3,947,678, Cl. 240-11.40R.
Hercules Incorporated: *See—*
Leibfried, Raymond Thomas, 3,947,369.
Hernqvist, Karl Gerhard. Laser device. 3,947,781, Cl. 331-94.50D.
Herrera, Frank J., to Casa Herrera, Inc. Apparatus for proofing lumps of dough. 3,946,856, Cl. 198-84.000.
Hertz, Walter, to Siemens Aktiengsellschaft. Method and apparatus for arc quenching. 3,947,649, Cl. 200-144.00R.
Herzl, Peter J., to Fischer & Porter Company. Vortex flowmeter with external sensor. 3,946,608, Cl. 73-194.0VS.
Hester, Jackson B., Jr.: *See—*
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Hewlett-Packard Company: *See—*
Hanna, Kim L., 3,946,729.
Noguchi, Hitoshi; Maeda, Kohichi; and Kyo, Takeshi, 3,947,760.
Wells, Perry L., 3,946,494.
Hiedecker, Robert F.; Johnson, A. Kenneth; and Royer, Galen B., to Dynastor, Inc. Flexible disc recording apparatus. 3,947,886, Cl. 360-99.000.
Hildebrand, Otto: *See—*
Stotz, Wolf Gunter; and Hildebrand, Otto, 3,947,317.
Hill, Harold Taylor: *See—*
Gazzard, Simon Thomas; and Hill, Harold Taylor, 3,947,607.
Hille, Peter Michael; and Petrikat, Klaus Rudiger, to International Standard Electric Corporation. Glass encapsulated capacitor with pressure connected cathode lead. 3,947,735, Cl. 317-230.000.
Hills, William A., to FMC Corporation. Polyesters containing bicyclic phosphate flame retardant. 3,947,423, Cl. 260-45.80R.
Hilsum, Cyril; and Mears, Adrian Leonard, to United Kingdom of Great Britain and Northern Ireland, Secretary of State for Defence in Her Britannic Majesty's Government of the. Electro-optic matrix-type display panel incorporating optoelectronic addressing switches. 3,947,842, Cl. 340-324.00R.
Hino, Hajime; Sasaki, Yoshiyuki; and Fujisawa, Yukimasa, to Teijin Limited. Bulky multifilament yarn and process for manufacturing the same. 3,946,548, Cl. 57-140.00J.
Hipp, James Edward, to Brown Equipment & Service Tools, Inc. Well tool and method of use therefor. 3,946,819, Cl. 175-296.000.
Hirai, Hajime: *See—*
Matsui, Masanao; Horiuchi, Fukashi; Hirai, Hajime; and Itaya, Nobushige, 3,947,519.
Hirata, Masakuni: *See—*
Takano, Kazuro; Hirata, Masakuni; and Kodera, Yasuo, 3,946,832.
Hirmann, Georg, to Inventa Ag fur Forschung und Forschung und Patentveruertung Zurich. Drive arrangement to produce a rotary or turning motion by means of a fluid or gaseous pressure medium. 3,946,641, Cl. 91-491.000.
Hirosawa, Koichiro: *See—*
Murakami, Noboru; Hirosawa, Koichiro; Ohara, Kazuo; and Matsuo, Koichi, 3,946,622.
Murakami, Noboru; Matsuo, Koichi; Hirosawa, Koichiro; and Ohara, Kazuo, 3,946,623.
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Hirozawa, Koichiro: *See—*
Murakami, Noboru; Hirozawa, Koichiro; and Takahashi, Shigeo, 3,946,760.

Hirschmann, Ralph F., to Merck & Co., Inc. 16-Alkyl-1,4,9(11)-pregnatrienes and 9,11-epoxides thereof. 3,947,409, Cl. 260-239.55R.

Hirst, Kenneth: *See—*
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Hishiyama, Sadao: *See—*
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Hitachi Chemical Company, Ltd.: *See—*
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Hitachi, Ltd.: *See—*
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Kimura, Isamu; and Hayashi, Takumi, 3,947,749.
Kobayashi, Yoshiki; Bandoh, Tadaaki; and Hara, Toshitaka, 3,947,818.
Ogata, Masatsugu; and Sato, Mikio, 3,947,395.
Otubo, Osamu; Tatsuno, Yujiro; Ikeda, Takatoshi; and Tsubaki, Toshio, 3,947,190.
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Hitachi Medical Corporation: *See—*
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Hluchan, Stephen Andrew, to Bourns, Inc. Pressure transducer. 3,946,615, Cl. 73-398.00R.

Hobbs, Charles C.; and van't Hof, Hendrik A., to Celanese Corporation. Liquid phase oxidation of methyl ethyl ketone to form acetic acid therefrom. 3,947,497, Cl. 260-541.000.

Hobby, John M., Jr. Arm wrestling unit. 3,947,025, Cl. 272-83.00R.

Hochmuth, Frank William, to Combustion Engineering, Inc. Turbine start-up system. 3,946,566, Cl. 60-646.000.

Hodges, John W.: *See—*
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Hodgson, Duncan Barry, to Lucas Electrical Company Limited, The. Fault indicating systems in vehicles. 3,947,811, Cl. 340-52.00F.

Hoechst Aktiengesellschaft: *See—*
Durckheimer, Walter; Raether, Wolfgang; and Seliger, Hubert Georg, 3,947,449.
Fuchs, Otto; and Troster, Helmut, 3,947,450.
Gengnagel, Kurt; Papenfuhs, Theodor; and Zimmermann, Manfred, 3,947,512.
Hunger, Klaus; and Papenfuhs, Theodor, 3,947,516.
Lehmann, Joachim Walter; and Lehinant, Armand, 3,947,353.
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Hoffman Electronics Corporation: *See—*
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Hoffman-La Roche Inc.: *See—*
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Scott, John William; Parrish, David Richard; and Saucy, Gabriel, 3,947,473.

Hoffmann-La Roche Inc.: *See—*
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Messersmith, Robert Earl, 3,947,586.

Hofmann, Alfred. Rotary apparatus for punching apertures into corrugated board material. 3,946,627, Cl. 83-117.000.

Hofmann, Eberhard: *See—*
Bechstein, Herbert; Biebl, Herbert; Eckell, Wolfgang; Franz, Anton; Hofmann, Eberhard; Stauch, Hans; Staudt, Heinrich; Tomasch, Hellmut; Urlberger, Alois; and Winnewisser, Theodor, 3,946,590.

Hofmann, Gunter A. G., to Hughes Aircraft Company. Method of forming a composite electrode. 3,947,342, Cl. 204-192.000.

Hofmann, Wilfried; Bickl, Horst; and Gutmann, Walter, to AGFA-Gevaert. Apparatus for retrieving microimages. 3,947,102, Cl. 353-27.00A.

Hoft, Donald J.; and Plutchak, Raoul E., to United States of America, Air Force. Phase stable variable phase slope limiter. 3,947,700, Cl. 307-237.000.

Hogg, Derek, to Dunlop Limited. Apparatus for use in removing tires from and mounting tires on wheel rims. 3,946,787, Cl. 157-1.240.

Hoglen, Edward L.: *See—*
Holden, Homer N.; Hunt, James P.; Browning, Vernon D.; Hoglen, Edward L.; and Kleykamp, Donald L., 3,946,483.

Hold 'Em, Inc.: *See—*
Wheat, G. F. Roy, 3,946,703.

Holden, Homer N.; Hunt, James P.; Browning, Vernon D.; Hoglen, Edward L.; and Kleykamp, Donald L., to Dayco Corporation. Apparatus for and method of removing a flexible tubular conduit from around an associated elongated rigid supporting mandrel. 3,946,483, Cl. 29-427.000.

Holland, Charles L.; and Rolla, Clarence P., to General Dynamics Corporation. Double flush riveting machine. 3,946,470, Cl. 29-34.00B.

Holm, Kurt Anders; and Norstrom, Gote Jan Wilhelm, to Uddeholms Aktiebolag. Apparatus for cleaning the surface of plate-shaped objects by means of at least two brushes. 3,946,454, Cl. 15-77.000.

Holman, James G.: *See—*
Carnahan, Samuel U.; and Holman, James G., 3,947,846.

Holmes, Julian C., to United States of America, Navy. Voltage and temperature compensated linear rectifier. 3,947,706, Cl. 307-310.000.

Holt, Paul, to Chrysler United Kingdom Limited. Fan assemblies. 3,947,148, Cl. 415-119.000.

Holtschmit, Heinz: *See—*
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Homma, Yasuo: *See—*
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Hoornenborg, Bart C.: *See—*
Graat, Johannes W.; Pelser, Johannes C. H.; and Hoornenborg, Bart C., 3,947,217.

Hopkins, David Alan, to Valeron Corporation, The. Cutting insert locking means. 3,946,475, Cl. 29-105.00R.

Hoppe, Joachim: *See—*
Grottrup, Helmut; Hoppe, Joachim; and Haghiri, Yahya, 3,946,869.

Hoppner, Werner F., to Xerox Corporation. Document feeding apparatus. 3,947,111, Cl. 355-50.000.

Hori, Jiro, to Sailor Pen Co., Ltd., The. Socket for a ball point pen. 3,947,137, Cl. 401-217.000.

Horie, Ikutaro: *See—*
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Horiie, Shigeki; Kurematsu, Susumu; Asai, Shinichiro; and Saito, Chiaki, to Denki Kagaku Kogyo K.K. Process for preparing a film of a tapered copolymer of styrene-butadiene or mixtures thereof. 3,947,536, Cl. 264-95.000.

Horiuchi, Fukashi: *See—*
Matsui, Masanao; Horiuchi, Fukashi; Hirai, Hajime; and Itaya, Nobushige, 3,947,519.

Horiuchi, Michimasa; and Narita, Hiroshi, to Hitachi, Ltd. Regenerative braking controller for a DC motor. 3,947,739, Cl. 318-376.000.

Horlin, Dick Axel, to Grangesbergs Industrivaru AB. Ejector. 3,946,948, Cl. 239-453.000.

Horung, Adolf; and Kistner, Werner, to Maschinenbau Oppenweiler GmbH. Control arrangement for sheet feeder. 3,947,016, Cl. 271-12.000.

Hostetler, Eldon, to Chore-Time Equipment, Inc. Trough feeder with shield for growing fowl. 3,946,701, Cl. 119-18.000.

Hotchkiss, Stuart E.; and Fowler, Reginald H., to Xerox Corporation. Indexing means for donor roll. 3,946,850, Cl. 197-1.00R.

Hotta, Seiji: *See—*
Akamatsu, Takashi; Koga, Koichi; Kondo, Mitsuru; Miyake, Makoto; Twasaki, Hiroshi; Matsuo, Masatoshi; Hotta, Seiji; Yuji, Isao; and Ito, Yukiaki, 3,947,471.

Houlihan, William J., to Sandoz, Inc. 5-Hydroxy-5-substituted phenylpyrrolidones and piperidinones. 3,947,460, Cl. 260-293.760.

Houser, Raymond E., to Rohr Industries, Inc. Disc brake and actuator assembly. 3,946,837, Cl. 188-72.400.

Houvouras, Michael P. Roto-flex coupling. 3,946,603, Cl. 73-136.00B.

Howes, Ronald Bruce, Jr.: *See—*
Dahill, Edward Kevin; and Howes, Ronald Bruce, Jr., 3,947,881.

Howland, Bradford. Eye-test lens and method. 3,947,186, Cl. 351-17.000.

Howlett, Donald E.: *See—*
Marburger, Ivan L.; Howlett, Donald E.; and Nagel, Lawrence J., 3,946,969.

Hozumi, Yukio; Ohi, Akira; Toga, Yuzo; Yoshizaki, Hiroyuki; Takanohashi, Hiromitsu; and Masuda, Yoshitaka, to Daicel Ltd.; and Mitsubishi Gas Chemical Company Inc. Resin composition having high impact resistance. 3,947,524, Cl. 260-873.000.

Hrabec, Charles: *See—*
Pepiciello, Anthony J.; and Hrabec, Charles, 3,946,846.

Hrabovsky, Vaclav: *See—*
Kremr, Milan; and Hrabovsky, Vaclav, 3,947,316.

Hradel, Joseph R.; and Staadt, Harold E., to Dow Chemical Company, The. Ammonium nitrate explosive composition. 3,947,301, Cl. 149-43.000.

Hsiang-Lai, Wen; and Chan, Gaylord, to Biopulse Company Limited. Apparatus for generating positive and negative electric pulses for application to a living body for therapeutic purposes. 3,946,745, Cl. 128-421.000.

Hsiao, Perng; and Musa, Fuad H., to Motorola, Inc. Differential amplifier. 3,947,778, Cl. 330-30.00D.

Hsu, Nelson Nae-Ching: *See—*
Burkhard, Herbert; Hsu, Nelson Nae-Ching; and Fetter, Edward Joseph, 3,947,400.

Huang, Keng Tang: *See—*
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Hubbell, Franklin R., III, to Tenneco Inc. Insulator sleeve for conduits. 3,946,764, Cl. 138-148.000.

Hubbell, Kenneth C. Segmented circumferentially split collet pad with replaceable serrations. 3,947,048, Cl. 279-41.00A.

Hubble, David H.: *See—*
Frech, Louis W.; Hubble, David H.; and Zook, Lewis J., 3,947,002.
Hubel, Roland: *See—*
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Huber, Albert: *See—*
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Huber, Otto L.: *See—*
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Huber, Ulrich: *See—*
Wild, Jost; and Huber, Ulrich, 3,947,405.
Hudecek, Carl J., to Owens-Illinois, Inc. Thermally crystallizable glasses possessing precision controlled crystallization and flow properties and process of producing same. 3,947,279, Cl. 106-39.600.
Hug, Alfred, to Hug Interlizenz AG. Process and apparatus for measuring the apparent power fed to an alternating current consumer. 3,947,762, Cl. 324-142.000.
Hug Interlizenz AG: *See—*
Hug, Alfred, 3,947,762.
Hughes Aircraft Company: *See—*
Bockwoldt, Walter H., 3,947,826.
Hofmann, Gunter A. G., 3,947,342.
Noyes, Gary R., 3,947,084.
Hughes, John Lawrence; and Liu, Robert Chung-Huan, to Armour Pharmaceutical Company. 5'-(8'-Hydroxyquinolyl)guanidine compounds. 3,947,455, Cl. 260-288.00R.
Hughes Tool Company: *See—*
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Ishida, Koji. Escalator belt cleaner. 3,946,853, Cl. 198-16.00R.
Ishida, Yasuhiko; Wakita, Nobuaki; and Yokota, Masato, to Toyota Jidosha Kogyo Kabushiki Kaisha. Purification of exhaust gas. 3,947,545, Cl. 423-213.700.
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Ito, Masatomo; and Naito, Taketosi, to Showa Denko K.K. Process for preparation of N,N-dialkyl toluamide. 3,947,514, Cl. 260-558.00R.
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Jaggers, Brian George; Ufton, Keith Frederick; and Wagner, Horst Richard, to Bush Boake Allen Limited. Solid sterilizing compositions. 3,947,574, Cl. 424-127.000.
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Javan, Ali, to Massachusetts Institute of Technology. Imaging devices. 3,947,630, Cl. 178-7.100.
Javan, Ali, to Massachusetts Institute of Technology. Electron tunneling device. 3,947,681, Cl. 250-211.00J.
Jay, Richard S., to Jarke Corporation. Hinged post storage rack. 3,946,876, Cl. 211-60.00R.
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Jerabek, Robert D.; and Marchetti, Joseph R., to PPG Industries, Inc. Method of electrodepositing self-crosslinking cationic compositions. 3,947,338, Cl. 204-181.000.
Jerabek, Robert D.; Marchetti, Joseph R.; and Zwack, Robert R., to PPG Industries, Inc. Method of electrodepositing primary amine group-containing cationic resins. 3,947,339, Cl. 204-181.000.
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Johnston, Howard, to Dow Chemical Company, The. Substituted pyridazinyloxy(thio)phenyl ureas and derivatives thereof. 3,947,437, Cl. 260-250.00A.

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Jones, Giffin D., to Dow Chemical Company, The. 2-(Isothiocyanatomethyl)-1,3-butadiene and polymers thereof. 3,947,427, Cl. 260-77.50R.

Jones, John L.; Rubino, Andrew M.; and Lindahl, Charles B., to Armour Pharmaceutical Company. Zinc complexes of basic aluminum chlorides and methods of making same. 3,947,556, Cl. 423-463.000.

Jones, John L.; Rubino, Andrew M.; and Lindahl, Charles B., to Armour Pharmaceutical Company. Zinc complexes of basic aluminum bromides and methods of making same. 3,947,557, Cl. 423-463.000.

Jones, Kenneth Wood; and Hazeldine, David John, to BPB Industries Limited. Accelerator. 3,947,285, Cl. 106-111.000.

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Jordan, Charles L., to Aluminum Company of America. Tabless container opening device and method and tools for forming the same. 3,946,683, Cl. 113-15.00A.

Jordan, James Redmon; and Kelly, Robert Graham, to National Research Development Corporation. Apparatus for comparing two binary signals. 3,947,673, Cl. 235-181.000.

Jordan, William E.; Steiner, Edward L.; and Fiske, Kenton W., to Xerox Corporation. Vacuum system control. 3,946,920, Cl. 226-39.000.

Joslyn, John. Mosaic block toy. 3,946,514, Cl. 46-1.00R.

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Kachik, Robert H.; and Pignocco, Arthur J., to United States Steel Corporation. Method of forming a high-temperature abrasion-resistant coating on a ferrous metal substrate. 3,946,793, Cl. 164-54.000.

Kachik, Robert H.; and Pignocco, Arthur J., to United States Steel Corporation. High-temperature abrasion-resistant coating on a ferrous metal substrate. 3,947,254, Cl. 29-195.000.

Kaes, Hans-Herbert, to Ernst Leitz GmbH. Inorganic vitreous detector material. 3,947,282, Cl. 106-54.000.

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Kaiser, Fritz; Schaumann, Wolfgang; Stach, Kurt; and Voigtlander, Wolfgang, to Boehringer Mannheim GmbH. Dihydrodigoxin compounds and therapeutic compositions. 3,947,404, Cl. 260-210.500.

Kaiser, Renate: *See—*
Rehder, Ludwig; Kaiser, Renate; and Lorenz, Roland, 3,947,714.

Kalafus, Edward F.; and Wise, Richard M., to General Tire & Rubber Company, The. Bonding polyesters to rubber with an aqueous emulsion adhesive containing a alkali metal free emulsifier. 3,947,394, Cl. 260-23.70A.

Kali-Chemie AG: *See—*
Musall, Reimar; and Wolsing, Wilhelm, 3,947,252.

Kalisky, Avram: *See—*
Weinberger, Zvi; and Kalisky, Avram, 3,947,128.

Kaloi, Cyril M., to United States of America, Navy. Notch fed electric microstrip dipole antenna. 3,947,850, Cl. 343-795.000.

Kamei, Tatsuya: *See—*
Yatsuo, Tsutomu; Kamei, Tatsuya; and Wajima, Koichi, 3,947,864.

Kamibayashi, Tetsusaburo: *See—*
Kobayashi, Toshihiko; and Kamibayashi, Tetsusaburo, 3,947,831.

Kamio, Takenori, to Kabushiki Kaisha Daikin Seisakusho. Clutch release clearance adjuster. 3,946,845, Cl. 192-111.00A.

Kanao, Seizo: *See—*
Misato, Tomomasa; Huang, Keng Tang; Homma, Yasuo; Kanao, Seizo; Toyoda, Takeshi; Suyama, Tadashi; and Shida, Toshiro, 3,947,589.

Kanbara, Kenjiro; Hattori, Masayuki; and Yoda, Jihei, to Nippon Steel Corporation. Method of raising the temperature of reducing gas containing CO component. 3,947,234, Cl. 432-2.000.

Kanehira, Katsuyuki: *See—*
Okada, Takeshi; and Kanehira, Katsuyuki, 3,946,727.

Kangas, Donald A.; and Neuendorf, W. Robert, to Dow Chemical Company, The. Coacervation of anion-containing aqueous disperse systems with amphoteric polyelectrolytes. 3,947,396, Cl. 260-29.300.

Kanner, Bernard: *See—*
Prokai, Bela; and Kanner, Bernard, 3,947,386.

Kanzaki Paper Manufacturing Co., Ltd.: *See—*
Akamatsu, Takashi; Koga, Koichi; Kondo, Mitsuru; Miyake, Makoto; Twasaki, Hiroshi; Matsuo, Masatoshi; Hotta, Seiji; Yuji, Isao; and Ito, Yukiaki, 3,947,471.

Kapoor, Virendra Nath: *See—*
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Karazija, Arvin: *See—*
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Karl, Gerhard. Windshield soil detector. 3,947,131, Cl. 356-209.000.

Kastelic, Raymond: *See—*
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Kasuya, Taro: *See—*
Yamazaki, Hironobu; Kubota, Reizo; Uchida, Yoshiaki; Kasuya, Taro; and Seki, Norikazu, 3,946,605.

Kato, Takashi; Yoshizawa, Toshio; Suzuki, Yoshihisa; and Ueda, Shozo, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho; and Daiwa Boseki Kabushiki Kaisha. Method for transporting textile yarn packages. 3,946,884, Cl. 214-152.000.

Kawabata, Hidetoshi: *See—*
Tanaka, Susumu; Enoguchi, Yuji; and Kawabata, Hidetoshi, 3,947,019.

Kawagoshi, Sakae; and Funabiki, Kunio, to Nissan Motor Company, Limited. Method for forming γ-alumina coating on refractory article. 3,947,340, Cl. 204-181.000.

Kawakami, Nobuo: *See—*
Hashimoto, Mitsuo; Kawakami, Nobuo; Nakagawa, Kazuhiko; and Fujieda, Yasuhiko, 3,947,540.

Kawano, Toshio; Mori, Takaro; and Kubota, Hachiro, to Onoda Cement Co., Ltd. Expansive cement additive and process for producing the same. 3,947,288, Cl. 106-314.000.

Kawasaki, Kazuo, to Nissan Denshi Kabushikigaisha. Combined transceiver and radio unit. 3,947,766, Cl. 325-25.000.

Kaye, Albert Edward; and Tucker, Alan Cyril, to Imperial Chemical Industries Limited. Manufacture of 2-(alkyl)amino-4-hydroxy-5-alkylpyrimidines. 3,947,440, Cl. 260-256.40C.

Keel, Frederick: *See—*
Townsend, Keith Gerald; and Keel, Frederick, 3,946,577.

Kehren, Jakob. Tree and the like obstacle extractor. 3,946,988, Cl. 254-30.000.

Keith, Robert J. Tire with wide laterally offset tread. 3,946,784, Cl. 152-352.00R.

Kelly, John, representative: *See—*
Kelly, William, deceased; Kelly, Monica, representative; Kelly, John, representative; and Halpern, Alfred, 3,947,491.

Kelly, Monica, representative: *See—*
Kelly, William, deceased; Kelly, Monica, representative; Kelly, John, representative; and Halpern, Alfred, 3,947,491.

Kelly, Ralph; and Ritter, Edmond Jean, to Cincinnati Milacron, Inc. Mildness additive. 3,947,382, Cl. 252-542.000.

Kelly, Robert Graham: *See—*
Jordan, James Redmon; and Kelly, Robert Graham, 3,947,673.

Kelly, William, deceased; by Kelly, Monica, representative; by Kelly, John, representative; and Halpern, Alfred, to Purdue Frederick Company, The. Stabilized choline salicylate compounds. 3,947,491, Cl. 260-501.150.

Kelsey-Hayes Company: *See—*
Di Grasso, Leonard, 3,946,928.
Marsh, Jeffrey D.; and McPherson, Gregg K., 3,946,482.

Kemper, Kate. Dough rolling machine. 3,947,179, Cl. 425-223.000.

Kempster, Barry A.: *See—*
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Kendall Company, The: *See—*
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Kenney, Michael John: *See—*
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Kerwin, Richard G.: *See—*
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Keyes, John Harold; Strickland, Charles Irvin; and Strickland, Robert George, to International Solarthermics Corporation. Solar heat collector. 3,946,720, Cl. 126-270.000.

Keyes, John Harold; Strickland, Charles Irvin; and Strickland, Robert George, to International Solarthermics Corporation. Method of collecting and storing solar heat. 3,946,721, Cl. 126-270.000.

Keyes, John Harold; Strickland, Charles Irvin; and Strickland, Robert George, to International Solarthermics Corporation. Method of heating a building structure with solar heat. 3,946,944, Cl. 237-1.00A.

Khaitin, Alexandr Alexandrovich: *See—*
Bark, Semen Efimovich; Garkusha, Ivan Semenovich; Kafyrin, Jury Pavlovich; Kreinin, Efim Vulfovich; Fedorov, Nikolai Ananievich; Shulyak, Vladimir Fedorovich; Khaitin, Alexandr Alexandrovich; Alexandrov, Sergei Gavrilovich; Bobrov, Marat Mikhailovich; Goman, Vyacheslav Grigorievich; Ermolaev, Viktor Sergeevich; Leonov, Sergei Vladimirovich; and Mikheev, Vikenty Pavlovich, 3,946,719.

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Kieffaber, Clarence A., to Marion Corporation. Method of making a uniform dough mixture containing scrap dough. 3,947,597, Cl. 426-27.000.

Kim, Tai K.: *See—*
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Kimura, Isamu; and Hayashi, Takumi, to Hitachi, Ltd. Apparatus for generating high voltage for cathode-ray tube. 3,947,749, Cl. 321-47.000.

Kimura, Shuji; and Daitoku, Kouichi, to Nippon Kogaku. Film frame counting devices for still cameras. 3,947,861, Cl. 354-217.000.

Kimura, Takashi; Ogita, Toshiyuki; and Sumihana, Takahiro, to Tokyo Shibaura Electric Co., Ltd. Gate control of thyristor converters for reversibly driving a D.C. electric motor. 3,947,737, Cl. 318-257.000.

Kindell, Colin David: *See—*
Ahmed, Kamal; and Kindell, Colin David, 3,947,083.

Kinder, Claude E.; Jones, Robert L., Jr.; and Marsh, Walter W. Apparatus and method for processing photographic paper strip. 3,947,109, Cl. 355-29.000.

Kinh, Vu Quang; and Montuelle, Jean, to Agence Nationale De Valorisation De La Recherche (ANVAR). Methods for forming an electrolytic deposit containing molybdenum on a support and the products obtained thereby. 3,947,331, Cl. 204-37.00R.

Kirchgessner, Robert W., Jr.: *See—*
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Kishino, Shigeo; Kudamatsu, Akio; Takase, Iwao; Shiokawa, Kozo; and Yamaguchi, Shin-Ichi, to Bayer Aktiengesellschaft. O-ethyl-S-propyl-dithiophosphoric acid phenyl or naphthyl esters. 3,947,529, Cl. 260-940.000.

Kiss, Marvin L.: *See—*
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Kistner, Werner: *See—*
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Kitsugi, Kyoichi; and Kozeki, Seizo, to Onoda Cement Company, Limited. Method for solidifying sludge. 3,947,284, Cl. 106-89.000.

Kiyoshi, Hideo; and Morota, Masaaki, to Yashica Co., Ltd. Magnetically releasing device for camera shutters. 3,947,857, Cl. 354-234.000.

Klappert, Helmut: *See—*
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Klauke, Erich: *See—*
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Kleemann, Thomas; and Rothmayr, Willy, to Societe D'Assistance Technique Pour Produits Nestle, S.A. Agglomeration apparatus. 3,947,166, Cl. 425-7.000.

Klein, Frank Nicholas, to Eaton Corporation. Fault commutation system for static inverters. 3,947,748, Cl. 321-11.000.

Klein, Schanzlin & Becker Aktiengesellschaft: *See—*
Klepp, Christian; Koll, Gunter; and Schwartz, Waldemar, 3,947,154.
Matthias, Heinz-Bernd; Klepp, Christian; and Koll, Gunter, 3,947,153.

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Klepp, Christian; Koll, Gunter; and Schwartz, Waldemar, to Klein, Schanzlin & Becker Aktiengesellschaft. Pump assembly for circulation of coolant in boiling water reactors or the like. 3,947,154, Cl. 417-373.000.

Klepp, Christian: *See—*
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Kletskin, Solomon Zalmanovich: *See—*
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Kleykamp, Donald L.: *See—*
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Klucker, Klaus: *See—*
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Klygis, Mindaugas Julius; and Owen, Ronald C., to Illinois Tool Works Inc. Container package. 3,946,862, Cl. 206-150.000.

Knabel, Walter: *See—*
Jarchow, Friedrich G. K.; Haensel, Dietrich; Hempelmann, Willi; Sturmath, Rainer; Ringleben, Hans; and Knabel, Walter, 3,947,311.

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Knapp, Seth Raymond, to Knapp, Faurilda Ferne. Novel cutter elements for drill bits. 3,946,820, Cl. 175-341.000.

Knauft, Guenter: *See—*
Geng, Hellmuth Roland; Hajdu, Johann; and Knauft, Guenter, 3,947,671.

Knickerbocker, Karl. Coin totalizer mechanism. 3,946,848, Cl. 194-94.000.

Knight, Hoye, to Raymond Lee Organization, Inc. Disposable rain garment. 3,946,443, Cl. 2-82.000.

Knuth, Eugene W. Removable cutting mechanism. 3,946,778, Cl. 145-31.00A.

Kobayashi, Toshihiko; and Kamibayashi, Tetsusaburo, to Kokusai Denshin Denwa Kabushiki Kaisha. Word arrangement matrix memory of high bit density having a magnetic flux keeper. 3,947,831, Cl. 340-174.0BC.

Kobayashi, Yoshiki; Bandoh, Tadaaki; and Hara, Toshitaka, to Hitachi, Ltd. Bus-coupler. 3,947,818, Cl. 340-147.0LP.

Kobayashi, Yugoro, to Ricoh Co., Ltd. Device for automatically separating a photosensitive sheet from an original for copying apparatus. 3,947,020, Cl. 271-172.000.

Kobe Steel, Ltd.: *See—*
Hashimoto, Mitsuo; Kawakami, Nobuo; Nakagawa, Kazuhiko; and Fujieda, Yasuhiko, 3,947,540.
Uchimoto, Yoshikazu; and Fujimura, Kazuo, 3,946,798.
Yamasaki, Tatsuo; Ide, Hideaki; Yamaguchi, Yoshihiro; Matsushita, Tomiharu; and Nakahara, Yuuzi, 3,946,584.

Kobler, Paul, to Kobler, Paul. Catamenial tampon. 3,946,737, Cl. 128-285.000.

Kobylinski, Thaddeus P.; and Swift, Harold E., to Gulf Research & Development Company. Metal chrysotile methane synthesis catalyst. 3,947,483, Cl. 260-449.00M.

Koch, Stanislaus H., to Clark Equipment Company. Grapple skidder with self-centering grapple support mechanism. 3,946,882, Cl. 214-147.00G.

Kock, Heinz-Gerhard A.: *See—*
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Kockler, Barry C., to Xerox Corporation. Self-aligning pinch roll for magnetic card transport system. 3,947,022, Cl. 271-250.000.

Kodera, Yasuo: *See—*
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Koga, Koichi: *See—*
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Kohr, Gilbert E.: *See—*
Chupka, David E.; Lehman, Donald F.; and Kohr, Gilbert E., 3,947,314.

Kohrman, Robert E.; and Phadtare, Pratap G., to Central Michigan University Board of Trustees. Stabilizer composition for dyestuffs. 3,947,247, Cl. 8-44.000.

Koike, Shin'Ichi; and Fujimoto, Hiroshi, to Nippon Electric Company, Limited. Multilevel data transmission system. 3,947,767, Cl. 325-38.00A.

Kojima, Hiromitsu; and Yoshida, Kimio, to Mitsui Mining & Smelting Co., Ltd.; and Fuji Sangyo Co., Ltd. Transporting method. 3,946,854, Cl. 198-21.000.

Kokusai Denshin Denwa Kabushiki Kaisha: *See—*
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Kokusan Denki Co., Ltd.: *See—*
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Matthias, Heinz-Bernd; Klepp, Christian; and Koll, Gunter, 3,947,153.

Kollar, John, to Halcon International, Inc. Process for treating reaction mixtures by chemical reduction. 3,947,500, Cl. 260-618.00H.

Kollar, John, to Halcon International, Inc. Process for treatment of reaction mixtures by hydrogenation. 3,947,501, Cl. 260-618.00H.

Komatsu, Fumihito; and Isaka, Akihiko, to Kabushiki Kaisha Sankyoseiki Seisakusho. Automatic stop mechanism for an electric tape apparatus. 3,946,966, Cl. 242-191.000.

Komatsu, Kojiro: *See—*
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Komiya, Kunihiko: *See—*
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Komori, Hideo: *See—*
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Konitz, William A.: *See—*
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Konrath, Karl, to Robert Bosch GmbH. RPM regulator for fuel injection pumps. 3,946,716, Cl. 123-140.00A.

Koppa, Daniel A., to Nabisco Inc. Conveyor system for transferring rigid sheets between right angled conveyors. 3,946,626, Cl. 83-105.000.

Koppa, Daniel Anthony: *See—*
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Kranz, Richard, to Tension Envelope Corporation. Two piece mailer. 3,946,938, Cl. 229-73.000.

Kreinin, Efim Vulfovich: *See—*
Bark, Semen Efimovich; Garkusha, Ivan Semenovich; Kafyrin, Jury Pavlovich; Kreinin, Efim Vulfovich; Fedorov, Nikolai Ananievich; Shulyak, Vladimir Fedorovich; Khaitin, Alexandr Alexandrovich; Alexandrov, Sergei Gavrilovich; Bobrov, Marat Mikhailovich; Goman, Vyacheslav Grigorievich; Ermolaev, Viktor Sergeevich; Leonov, Sergei Vladimirovich; and Mikheev, Vikenty Pavlovich, 3,946,719.

Kremr, Milan; and Hrabovsky, Vaclav, to Statni vyzkumny ustav kozedelny. Method of preparing the backer for the manufacture of man-made leather. 3,947,316, Cl. 162-129.000.

Krohm, Reinhold; and Bahre, Karl, to Klockner-Werke Aktiengesellschaft. Conveyor construction. 3,946,860, Cl. 198-204.000.

Kruger, Joe Bill: *See—*
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Kubota, Narumi: *See—*
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Kubota, Reizo: *See—*
Yamazaki, Hironobu; Kubota, Reizo; Uchida, Yoshiaki; Kasuya, Taro; and Seki, Norikazu, 3,946,605.

Kuczkowski, John S.; and Konitz, William A., to Mortell Company. Synergistic biostatic composition. 3,947,576, Cl. 424-263.000.

Kudamatsu, Akio: *See—*
Kishino, Shigeo; Kudamatsu, Akio; Takase, Iwao; Shiokawa, Kozo; and Yamaguchi, Shin-Ichi, 3,947,529.

Kugler, Carl J., to Singer Company, The. Barometrically compensated pressure index continuous integrator for measuring throughput fluid flow of meters. 3,946,609, Cl. 73-233.000.

Kuhfus, Gerd, to Northern Electric Company, Limited. Telephone unit with retractable mounting bracket. 3,946,977, Cl. 248-126.000.

Kuhl, James R.: *See—*
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Kuhle, Engelbert; Klauke, Erich; and Frohberger, Paul-Ernst, to Bayer Aktiengesellschaft. N-sulfinyl-N'-aryl-hydrazines. 3,947,513, Cl. 260-551.00S.

Kuhlmann, George E., to Standard Oil Company. Quality of phthalic acids improved by haloacetic acid. 3,947,494, Cl. 260-524.00R.

Kuhtreiber, Franz. Process for utilising straw. 3,946,660, Cl. 100-39.000.

Kulpan, James A.: *See—*
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Kumazawa, Masuji, to Nippon Steel Corporation. Process for producing steel sheet of cube-on-face texture having improved magnetic characteristics. 3,947,296, Cl. 148-111.000.

Kummer, Rudolf, to BASF Aktiengesellschaft. Manufacture of 1,6-hexanediol from butadiene. 3,947,503, Cl. 260-635.00E.

Kunststoffwerk Gebruder Anger GmbH & Co.: *See—*
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Kupec, Emil J. Word game apparatus. 3,947,036, Cl. 273-130.00E.

Kuraray Co., Ltd.: *See—*
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Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
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Uchikawa, Shoji, 3,947,644.

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Kutney, John T.; and Mishler, Rodger B., to General Electric Company. Inlet noise deflector. 3,946,830, Cl. 181-33.0HA.

Kuwada, Yutaka; Tawada, Hiroyuki; and Meguro, Kanji, to Takeda Chemical Industries, Ltd. Triazolobenzodiazepine derivatives. 3,947,417, Cl. 260-244.00R.

Kwon, Joon Taek: *See—*
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Kyncl, Jaroslav; Lynn, Kathleen Riley; Martin, Yvonne Connolly; and Ours, Carroll Wayne, to Abbott Laboratories. Compositions and methods of increasing renal blood flow with gamma-glutamyl amide of dopamine. 3,947,590, Cl. 424-319.000.

Kyo, Sunao; Oka, Hideaki; Hayashi, Katsuhiko; and Tanaka, Hidetsugu, to Kuraray Co., Ltd. Separation and recovery of 3-methyl-3-butene-1-ol. 3,947,504, Cl. 260-643.00A.

Kyo, Takeshi: *See—*
Noguchi, Hitoshi; Maeda, Kohichi; and Kyo, Takeshi, 3,947,760.

La Balme, Maurice to Thomson Medical-Telco. Device for measuring pressure. 3,946,724, Cl. 128-2.05E.

Laboratorios Del Dr. Esteve SA: *See—*
Esteve-Subirana, Antonio, 3,947,448.

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Goodsmith, Dale H.; and Ladouceur, Harold A., 3,946,478.
Goodsmith, Dale H.; and Ladouceur, Harold A., 3,946,479.

LaFollette, Robert L.; and Miller, Kenneth H., to American Challenger Corporation. Inboard-outboard drive for marine vessel. 3,946,698, Cl. 115-35.000.

LaFollette, Robert L.; and Miller, Kenneth H., to American Challenger Corporation. Shift mechanism for a marine clutch. 3,946,841, Cl. 192-35.000.

La Forge, Louis H., Jr., to Tri-Century Industries. Intrusion alarm system. 3,947,838, Cl. 340-276.000.

l'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See—*
Louise, Jean; and Senechal, Guy, 3,947,546.

Lakshminarayanan, Krishnaiyer, to G. D. Searle and Co. Method for isolating high purity peroxidase. 3,947,324, Cl. 195-66.00R.

Laman, Joseph R., to Firestone Tire & Rubber Company, The. Burning used tires, etc. and apparatus therefor. 3,946,680, Cl. 110-18.00C.

Lambert, Andre: *See—*
Faugeras, Anne Marie; and Lambert, Andre, 3,947,805.

Lamm, Heinz, to Daimler-Benz Aktiengesellschaft. Radial seal for a rotary piston internal combustion engine. 3,947,162, Cl. 418-121.000.

Lampe, Hans H.: *See—*
Doehle, Lothar A.; Drescher, Heinz; Lampe, Hans H.; Pohle, Werner; and Rudolph, Peter, 3,947,824.

Lamson Paragon Limited: *See—*
Dewaele, Daniel Camille Cornelius, 3,947,116.

Lander, Harry L., to Story Chemical Corporation. Solid particle-form polymerizable polymeric material and compositions, structures and methods of employing and producing the same. 3,947,426, Cl. 260-77.5TB.

Landis, William R., to Honeywell Inc. Safety circuit for monitoring a flickering flame. 3,947,218, Cl. 431-79.000.

Landsman, Emanuel; and Landsman, Irving. Actuator cap for aerosol dispenser. 3,946,912, Cl. 222-402.130.

Landsman, Irving: *See—*
Landsman, Emanuel; and Landsman, Irving, 3,946,912.

Lane, Eckel R., to Dow Chemical Company, The. Method for cold forming plastic article. 3,947,539, Cl. 264-320.000.

Lane, Jack C.: *See—*
Duffek, Edward F.; Funk, Ernest J.; Jankowski, Alfred S.; Lane, Jack C.; Lehner, William L.; Oliver, Floyd F.; and Schneider, Mark R., 3,947,867.

Lanet, Jean-Claude: *See—*
Correia, Yves; and Lanet, Jean-Claude, 3,947,508.

Lang, William J.; and Krajewski, John J., to International Minerals & Chemical Corporation. Foundry sand compositions containing graft copolymers of biochemically-synthesized heteropolysaccharides. 3,947,392, Cl. 260-17.4GC.

Lange, Karlheinz, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Catalytic exhaust gas purification device. 3,947,253, Cl. 23-288.00F.

Lanvin-Charles of the Ritz, Inc.: *See—*
Murphy, John H.; and Lieberman, George, 3,947,571.

Laporte, Jean Andre. Seat-belt restrainer. 3,947,058, Cl. 280-150.0SB.

Larkfeldt, Birger, to Aktiebolaget Svenska Flaktfabriken. Device for preferably cooling a room by a ventilation air stream. 3,946,647, Cl. 98-38.00R.

Larson, Richard A., to Hanson Industries Inc. Ski binding. 3,947,052, Cl. 280-11.35K.

Larson, Willis A.; and Colglazier, David E., to Magic Dot, Inc. Touch actuated electronic switch. 3,947,696, Cl. 307-116.000.

Larsson, Raymond P., to Bio-Medical Sciences, Inc. Time-temperature integrating indicator. 3,946,611, Cl. 73-356.000.

Lasch, Cecil A., Jr. Fluid bearing transfer and heat treating apparatus and method. 3,947,236, Cl. 432-11.000.

Lasco, Ralph H., to Diamond Shamrock Corporation. Oxidation of allylacetone to 2,5-hexanedione. 3,947,521, Cl. 260-593.00R.

Lasher, Richard W.: *See—*
Myers, John L.; Lasher, Richard W.; and James, Russell D., 3,947,286.

Lashko, Nikolai Fedorovich: *See—*
Tikhonova, Vera Viktorovna; Markov, Alexandr Ivanovich; Gerasimova, Marina Andreevna; Zhukova, Galina Ivanovna; Altman, Morits Borisovich; Timonova, Margarita Alexandrovna; Ershova, Tatyana Ivanovna; Krysin, Boris Trofimovich; Kitari-Oglu, Georgy Gerasimovich; Morozova, Galina Ivanovna; and Lashko, Nikolai Fedorovich, 3,947,268.

Laufer, Helmut, to Robert Boach GmbH. RPM regulator for fuel injection pumps. 3,946,713, Cl. 123-139.0AD.

Laug, George H.: *See—*
Tribbett, Murray C.; and Laug, George H., 3,947,196.

Laurie, Alec Hibburd. Aeration and mixing of liquids. 3,947,359, Cl. 210-221.00P.

Laval, Claude C., Jr. Apparatus for removing particles from fluid. 3,947,364, Cl. 210-512.00R.

Lavallee, Robert G.: *See—*
Grolman, Bernard; and Lavallee, Robert G., 3,947,099.

Lavaux, Jean-Paul: *See—*
Derible, Pierre Henri; and Lavaux, Jean-Paul, 3,947,578.

Lawrence Brothers, Inc.: *See—*
Johnson, Larry K., 3,946,460.

Lawrence, James Michael: *See—*
Giger, Robert John; and Lawrence, James Michael, 3,947,632.

Lawrence, John S., to Browning Arms Company. Pack frame length adjusting coupling. 3,946,916, Cl. 224-25.00A.

Lawrence Peska Associates, Inc.: *See—*
Archer, Edward, 3,947,038.
Bouchard, Andre, 3,947,035.
Mirshak, Richard C., 3,946,699.
Musto, Michael, 3,946,786.
Stoveken, James N.; and Glokner, Mary L., 3,946,878.

Laymon, Marvin D., to GTE Sylvania Incorporated. Fence protection system. 3,947,835, Cl. 340-261.000.

Lazaridis, Lazaros J., to Thermo Electron Corporation. Heap pipe vacuum furnace. 3,947,244, Cl. 432-205.000.

Lazzari, Jean-Pierre, to Compagnie Internationale pour l'Informatique. Electromagnetic transducers. 3,947,889, Cl. 360-113.000.

Lear Siegler, Inc.: *See—*
Sadler, Harry J.; Pareja, Ramon; and Leschisin, John, 3,947,157.

Leavitt, Richard A.: *See—*
Bull, Frederick W.; Leavitt, Richard A.; and Weiss, Robert L., 3,947,875.

Ledermann & Co.: *See—*
Heimbrand, Eberhard, 3,946,777.

Lednicer, Daniel, to Upjohn Company, The. Compounds and process for preparing the same. 3,947,520, Cl. 260-590.00D.

Lee, Alex Y.: *See—*
Gershberg, David N.; Lee, Alex Y.; and Parker, Clair F., Jr., 3,947,834.

Lee, Ho C.: *See—*
Chen, Winston H.; and Lee, Ho C., 3,947,851.

Lee, Joseph K; and Lee, Richard J. Ignition switch-activated message system. 3,947,812, Cl. 340-52.00D.

Lee, Richard J.: *See—*
Lee, Joseph K; and Lee, Richard J., 3,947,812.

Lee, Robert L. Dental clutch. 3,946,489, Cl. 32-17.000.

Lehinant, Armand: *See—*
Lehmann, Joachim Walter; and Lehinant, Armand, 3,947,353.

Lehman, Donald F.: *See—*
Chupka, David E.; Lehman, Donald F.; and Kohr, Gilbert E., 3,947,314.

Lehmann, Joachim Walter; and Lehinant, Armand, to Hoechst Aktiengesellschaft. Water purification process. 3,947,353, Cl. 210-52.000.

Lehnen, Josef Peter: *See—*
Menges, Hans George Ludwig; Harms, Engelbert Gerhard; and Lehnen, Josef Peter, 3,946,998.

Lehner, William L.: *See—*
Duffek, Edward F.; Funk, Ernest J.; Jankowski, Alfred S.; Lane, Jack C.; Lehner, William L.; Oliver, Floyd F.; and Schneider, Mark R., 3,947,867.

Leibfried, Raymond Thomas, to Hercules Incorporated. Lubricating oil base stock. 3,947,369, Cl. 252-57.000.

Leighton, Guy P., to Dravo Corporation. Combustion system. 3,947,001, Cl. 266-20.000.

Leisenberg, Manfred. Method and apparatus for controlling the air volume in a tunnel kiln according to the batch density. 3,947,237, Cl. 432-11.000.

Leitner, Lutz; and Hund, Franz, to Bayer Aktiengesellschaft. Production of finely divided acicular magnetic iron oxides. 3,947,502, Cl. 423-632.000.

Lemelson, Jerome H. Container with tear-weld opening means. 3,946,896, Cl. 220-273.000.

Lenox Candles, Inc.: *See—*
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Lentz, Robert A., to Eastman Technology, Inc. Apparatus for modifying the time base of signals. 3,947,874, Cl. 360-36.000.

Leonov, Sergei Vladimirovich: *See—*
Bark, Semen Efimovich; Garkusha, Ivan Semenovich; Kafyrin, Jury Pavlovich; Kreinin, Efim Vulfovich; Fedorov, Nikolai Ananievich; Shulyak, Vladimir Fedorovich; Khaitin, Alexandr Alexandrovich; Alexandrov, Sergei Gavrilovich; Bobrov, Marat Mikhailovich; Goman, Vyacheslav Grigorievich; Ermolaev, Viktor Sergeevich; Leonov, Sergei Vladimirovich; and Mikheev, Vikenty Pavlovich, 3,946,719.

Leopold, Phillip M.: *See—*
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Leroux, Pierre J.; and de Schilde, D. van de Werve, to Standard Oil Company, The. Building a lamination of fiberglass reinforced polyester resin on a rotating mandrel. 3,947,305, Cl. 156-62.400.

Leroy, Jules: *See—*
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Leschisin, John: *See—*
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Letson and Burpee Ltd.: *See—*
Allen, Francis Edwin; and McGuire, James Daniel, 3,946,634.

Lever Brothers Company: *See—*
Weil, Willi, 3,946,855.

Levites, Solomon. Injection molding apparatus having degating and sprue removal means. 3,947,210, Cl. 425-441.000.

Lewis, John Arnold: *See—*
Bagg, Greville Euan Gordon; Edwards, Henry; Evans, Michael Ernest Newcombe; Lewis, John Arnold; and Ziebland, Hans, 3,947,535.

Lewis, Richard P.: *See—*
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Lhonore, Pierre: *See—*
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Li, George S.; and Coffey, Gerald P., to Standard Oil Company, The. Polymerizates of olefinic nitriles and diene rubbers. 3,947,527, Cl. 260-879.000.

Li, Jorge P.: *See—*
Shen, Tsung-Ying; Li, Jorge P.; and Dorn, Conrad P., Jr., 3,947,582.

Licentia Patent-Verwaltungs-GmbH: *See—*
Daute, Otto, 3,947,755.

Licht, Theodore: *See—*
Gajer, Israel; Licht, Theodore; and Goodman, Harold, 3,946,870.

Lichtenstein, Eric S. Apparatus for extracorporeal treatment of blood. 3,946,731, Cl. 128-214.00R.

Lichtwardt, Harlow E.; Schrier, Bruce; Crutchley, Frank; and White, Thomas, to Rexham Corporation. Pressure sensitive label dispenser. 3,947,313, Cl. 156-584.000.

Lieberman, George: *See—*
Murphy, John H.; and Lieberman, George, 3,947,571.

Lightner, Robert W. Vending system for remotely accessible stored information. 3,947,882, Cl. 360-92.000.

Lincoln Electric Company, The: *See—*
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Lindaco Ltd.: *See—*
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Lindahl, Charles B.: *See—*
Jones, John L.; Rubino, Andrew M.; and Lindahl, Charles B., 3,947,556.
Jones, John L.; Rubino, Andrew M.; and Lindahl, Charles B., 3,947,557.

Linde Aktiengesellschaft: *See—*
Frischbier, Klaus, 3,947,259.
Schuster, Robert, 3,947,146.

Lindeman, Richard Jay, to Illinois Tool Works Inc. Lubricating bearing and bracket mounting. 3,947,076, Cl. 308-103.000.

Linebrink, Kail L.; and Smith, Lawrence S., to United Technologies Corporation. Pumping and metering system. 3,946,551, Cl. 60-39.28R.

Link, Helmut, to Index-Werke KG Hahn & Tessky. Means for moving reciprocable carriages for indexible tool turrets in machine tools. 3,946,471, Cl. 29-44.000.

Lion Fat & Oil Co., Ltd.: *See—*
Isa, Hiroshi; Mandai, Hiroshi; Ukigai, Toshiyuki; Tominaga, Anri; Taniyasu, Ryozo; and Nagayama, Masuzo, 3,947,507.
Isa, Hiroshi; Ukigai, Toshiyuki; Tominaga, Anri; Taniyasu, Ryozo; and Nagayama, Masuzo, 3,947,509.

Lipe Rollway Corporation: *See—*
Armstrong, Jack W., 3,946,459.

Lipes, Arnold. Bag holding device. 3,946,538, Cl. 53-189.000.

Lissant, Kenneth J.: *See—*
Mertz, Richard E.; and Lissant, Kenneth J., 3,946,994.

Litton Systems Inc.: *See—*
Diantonio, Daniel Joseph, 3,946,858.

Liu, Robert Chung-Huan: *See—*
Hughes, John Lawrence; and Liu, Robert Chung-Huan, 3,947,455.

LMC Data, Inc.: *See—*
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Locke, David R.; and Szymansky, Edward, to Sperry Rand Corporation. Portable electrical shaver with pivotally mounted motor. 3,946,486, Cl. 30-43.920.

Lockheed Aircraft Corporation: *See—*
Rettig, Terry W.; and Felsen, Marvin J., 3,946,600.

Lockheed Missiles & Space Company, Inc.: *See—*
Thompson, James P., 3,947,723.

Lodi, Frank, to Fast Heat Element Manufacturing Co., Inc. Temperature controlled cartridge heater. 3,947,656, Cl. 219-243.000.

Loewe-Opta GmbH: *See—*
Breitkreuz, Lutz, 3,947,720.
Geiger, Erich, 3,947,724.

Loffelman, Frank Fred; and Brady, Thomas Eugene, to American Cyanamid Company. Substituted halotriazines as peroxygen bleach activators. 3,947,374, Cl. 252-102.000.

Logis, John, Jr.: *See—*
Stevens, Daniel A.; Logis, John, Jr.; and Scheerer, Ronald C., 3,947,776.

Lohn, Klaus, to U. S. Philips Corporation. Diode ring mixer. 3,947,782, Cl. 332-29.00M.

Lohonen, Paavo, to Stal-Laval Turbin AB. Axial turbine split diaphragm locking device. 3,947,150, Cl. 415-219.00R.

Loktaeva, Valentina Vasilievna; Vikhirev, Vitaly Viktorovich; and Schegolev, Gleb Stepanovich. Stator of hydraulic machine with the end-face sealing of vanes. 3,947,147, Cl. 415-113.000.

Long Mfg. N. C., Inc.: *See—*
Long, William R., 3,946,542.

Long, William R., to Long Mfg. N. C., Inc. Tobacco harvesting and treating system. 3,946,542, Cl. 56-1.000.

Longuemare, Robert N., Jr.: *See—*
Carnahan, Samuel U.; and Longuemare, Robert N., Jr., 3,947,848.

Lonza, Ltd.: *See—*
Thiel, Reinhold; Zinsstag, Christoph; and Faschinger, Gunther, 3,947,543.

Loof, Philippus: *See—*
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L'Oreal: *See—*
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Lorenz, Roland: *See—*
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Lorraine, Jack Richardson: *See—*
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Louboutin, Herve J. P. M.: *See—*
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Louise, Jean; and Senechal, Guy, to l'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Process for the purification of gaseous effluents. 3,947,546, Cl. 423-242.000.

Lubnow, Harold, to United States of America, Navy. Automatically controlled magnetic minesweeping system. 3,946,696, Cl. 114-221.00R.

Lucas Aerospace Limited: *See—*
Menmuir, John; and Faulkes, Kenneth Milford, 3,947,859.

Lucas Electrical Company Limited, The: *See—*
Hodgson, Duncan Barry, 3,947,811.

Lucas, Howard R. Protective system for a capacitor voltage transformer. 3,947,725, Cl. 317-12.00B.

Luckenbach, Helge F.: *See—*
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Ludvigsen, Harald, to A/S Fredrikstad mek. Verksted. Transverse travelling crane for ships. 3,946,881, Cl. 214-15.00R.

Lukas, Helmut H.; and Dalgleish, Jack F., to Northern Electric Company, Limited. Clamp for an optical fibre. 3,946,467, Cl. 24-260.000.

Lummus Company, The: *See—*
Brooks, Maurice E.; Riegel, Herbert; Schindler, Harvey D., and Sze, Morgan C., 3,947,489.
Snell, George J.; and Kwon, Joon Taek, 3,947,346.

Lundberg, Robert D., to Exxon Research and Engineering Co. Novel ionic foams. 3,947,387, Cl. 260-2.50R.

Lusch, Ferdinand. Adjustable deck-chair. 3,947,069, Cl. 297-317.000.

Luthi, Hans: *See—*
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Lutz, Robert J.: *See—*
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Lutze, Walter: *See—*
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Lutzenberger, Kurt, to Switchcraft, Inc. Electrical slide switch. 3,947,391, Cl. 200-16.00D.

Lybarger, Hugh M., to Goodyear Tire & Rubber Company, The. Recovery of isoprene. 3,947,506, Cl. 260-681.50R.

Lyman, Thomas G., Jr. Climber's chockstone. 3,946,975, Cl. 248-1.000.

Lynn, Kathleen Riley: *See—*
Kyncl, Jaroslav; Lynn, Kathleen Riley; Martin, Yvonne Connolly; and Ours, Carroll Wayne, 3,947,590.

Lyon, John Jeffrey, to RCA Corporation. Altitude coding for collision avoidance system. 3,947,845, Cl. 343-6.5LC.

Lyons, Angus Loughlin, Jr.: *See—*
Pate, Oscar Glenn; and Lyons, Angus Loughlin, Jr., 3,946,571.

Maack, Norris N. Elevator system having co-moving and short-length annular-belt for suspending and propelling the carriage. 3,946,836, Cl. 187-8.000.

Mabuchi, Kenichi; Komatsu, Kojiro; and Tsuchimochi, Yoshihisa, to Mabuchi Motor Co. Ltd. Electric charger. 3,947,743, Cl. 320-2.000.

Mabuchi Motor Co. Ltd.: *See—*
Mabuchi, Kenichi; Komatsu, Kojiro; and Tsuchimochi, Yoshihisa, 3,947,743.

Macbeth, Albert William, to Thiokol Corporation. Rocket motor construction. 3,946,557, Cl. 60-253.000.

MacDonnell, Robert W., to Unity Railway Supply Co., Inc. AB-type piston assembly shipping cover. 3,946,873, Cl. 206-521.000.

Machida, Hideo: *See—*
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Machlett Laboratories, Inc., The: *See—*
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MacInnis, Martin B.; and Vanderpool, Clarence D., to GTE Sylvania Incorporated. Process for the reclamation of uncemented tungsten carbide powders. 3,947,555, Cl. 423-440.000.

MacInnis, Martin B.: *See—*
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Mac Intosh, Donald J.; and Stout, Edward L., to Sundstrand Corporation. Hydrostatic transmission control. 3,946,560, Cl. 60-421.000.

Mackaness, James B.; and Poitras, Edward. Self centering bogie. 3,946,676, Cl. 105-169.000.

MacManus, Daniel C., to General Motors Corporation. Submerged fuel pump with bevel sided impeller blades. 3,947,149, Cl. 415-213.00T.

MacPherson, Edwin J.: *See—*
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Tate, Jack F.; Maddox, Jim, Jr.; and Shupe, Russell D., 3,946,813.

Maeda, Kohichi: *See—*
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Maerfeld, Charles, to Thomson-CSF. Acoustic surface wave device comprising arrays of parallel metallic strips. 3,947,783, Cl. 333-30.00R.

Maezawa, Shuji, to Kabushiki Kaisha Suwa Seikosha. Field effect liquid crystal display device. 3,947,185, Cl. 350-160.0LC.

Magic Dot, Inc.: *See—*
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Magidson, Herbert; Huber, Otto L.; and Hennrich, Helmuth, to Moldex/Metric, Inc. Apparatus for preforming brassiere pads. 3,947,207, Cl. 425-398.000.

Magnoni, Franco: *See—*
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Magnuson, Roland A.; and Siorek, Richard W., to United States of America, Army. Heat engine power system. 3,946,705, Cl. 123-41.130.

Maguire, Gerald J.: *See—*
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Maki, Takeshi: *See—*
Miyazaki, Ken; Kubota, Narumi; Igarashi, Kooichi; Sato, Hiroshi; Takahashi, Kazutoshi; Maki, Takeshi; Hatano, Akira; and Kai, Masamitsu, 3,946,625.

Malinowski, Stanley: *See—*
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Malm, John A. Undercut saw. 3,946,631, Cl. 83-380.000.

Maltby, Jack, to Davy-Loewy Ltd. Rolling mills. 3,946,587, Cl. 72-237.000.

Mandai, Hiroshi: *See—*
Isa, Hiroshi; Mandai, Hiroshi; Ukigai, Toshiyuki; Tominaga, Anri; Taniyasu, Ryozo; and Nagayama, Masuzo, 3,947,507.

Manly, Donald G.: *See—*
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Mansmann, Manfred, to Bayer Aktiengesellschaft. Processing of aluminum oxide fibers. 3,947,534, Cl. 264-62.000.

Manufactura de Articulos para el Hogar "Aurora" Sociedad Anonima Industrial Comercial, Inmobiliaria y Financiera: *See—*
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Marathon Oil Company: *See—*
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Marburger, Ivan L.; Howlett, Donald E.; and Nagel, Lawrence J., to United States of America, Army. Folding tail fins. 3,946,969, Cl. 244-3.280.

Marchetti, Joseph R.: *See—*
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Jerabek, Robert D.; Marchetti, Joseph R.; and Zwack, Robert R., 3,947,339.

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Marconi Company Limited, The: *See—*
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Marder, William Z., to Zevco Enterprises, Inc. Self-priming centrifugal pump. 3,947,530, Cl. 261-7.000.

Marie, Gilbert: *See—*
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Marinis, Spyridon: *See—*
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Marion Corporation: *See—*
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Marion Laboratories, Inc.: *See—*
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Marketing Techniques, Inc.: *See—*
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Markov, Alexandr Ivanovich: *See—*
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Markov, Igor Alexandrovich: *See—*
Alien, Imant Karlovich; Popov, Jury Olegovich; Stolov, Lev Isaakovich; Yanson, Boris Albertovich; Markov, Igor Alexandrovich; and Nikonenko, Anatoly Vasilievich, 3,947,628.

Marling, John B., to United States of America, Energy Research and Development Administration. Isotope separation by selective photodissociation of glyoxal. 3,947,335, Cl. 204-158.00R.

Marquez Serra, Don Luis Antonio. Machine for placing injectable ampoules, vials and similar liquid containers in their respective holders. 3,946,536, Cl. 53-148.000.

Marquis, James A.: *See—*
Simmons, William W.; and Marquis, James A., 3,947,669.

Marsh, Jeffrey D.; and McPherson, Gregg K., to Kelsey-Hayes Company. Method of manufacturing a wheel speed sensor. 3,946,482, Cl. 29-404.000.

Marsh, Nat H.: *See—*
Grandine, Joseph D.; Marsh, Nat H.; and Snyder, James E., 3,947,345.

Marsh, Walter W.: *See—*
Kinder, Claude E.; Jones, Robert L., Jr.; and Marsh, Walter W., 3,947,109.

Marshall, Geoffrey; and Riseley, Eric Ivan, to Imperial Chemical Industries, Ltd. Process for uniformily drawing a tow of filaments. 3,947,538, Cl. 264-290.00T.

Martin, Douglas E.: *See—*
Glennon, Timothy P.; and Martin, Douglas E., 3,947,774.

Martin, Elam M. Hammer mills. 3,946,952, Cl. 241-56.000.

Martin, Eugene G., to Victor F. Weaver, Inc. Poultry breast sectioning machine. 3,946,461, Cl. 17-11.000.

Martin, Francisco Hidalgo. Exercise board. 3,947,023, Cl. 272-57.00R.

Martin, George G.; and Jones, Alvin J., to Milbar Corporation. Battery terminal cleaner. 3,946,456, Cl. 15-105.000.

Martin, Raymond G.: *See—*
Hahn, Norman; and Martin, Raymond G., 3,946,474.

Martin, Ronald L., to Honeywell Inc. Multi-position condition sensing device. 3,946,614, Cl. 73-363.500.

Martin, Yvonne Connolly: *See—*
Kyncl, Jaroslav; Lynn, Kathleen Riley; Martin, Yvonne Connolly; and Ours, Carroll Wayne, 3,947,590.

Maruwaseiko Kabushiki Kaisha: *See—*
Ogawa, Yonekichi, 3,947,134.

Maruyama, Masayuki; and Watanabe, Joichi, to Riken Piston Ring Kogyo Kabushiki Kaisha. Oil seal ring for internal combustion engine. 3,947,046, Cl. 277-235.00A.

Marzoli, Angelo, to F.lli Marzoli & C. S.p.A. Control device for equipment for winding yarn into cops. 3,946,956, Cl. 242-26.100.

Maschinenbau Oppenweiler GmbH: *See—*
Horung, Adolf; and Kistner, Werner, 3,947,016.

Maschinenfabrik Fahr AG: *See—*
Gail, Josef, 3,946,825.

Maschinenfabrik Wifag: *See—*
Werhli, Alfons, 3,947,356.

Mason, John Richard, to Dracon Industries. Automatic multi-conductor quick connect termination tool. 3,946,476, Cl. 29-203.00H.

Mason, Lawrence D.: *See—*
Diehl, Joseph O.; Germano, Carl A.; Mason, Lawrence D.; and Veres, David R., 3,947,765.

Massachusetts Institute of Technology: *See—*
Graneau, Peter, 3,947,622.
Javan, Ali, 3,947,630.
Javan, Ali, 3,947,681.

Massey, Gail A., to Oregon Graduate Center for Study and Research. Method of generating tunable coherent ultraviolet light at wavelengths below 2500 A. 3,947,688, Cl. 250-495.000.

Masuda, Michio: *See—*
Yumde, Yasufumi; Nabeyama, Hiroaki; and Masuda, Michio, 3,947,870.

Masuda, Yoshitaka: *See—*
Hozumi, Yukio; Ohi, Akira; Toga, Yuzo; Yoshizaki, Hiroyuki; Takanohashi, Hiromitsu; and Masuda, Yoshitaka, 3,947,524.

Mathews, James E.; Smith, Wayne A.; and Wilkinson, Lester, to General Motors Corporation. Keyed classical AGC system. 3,947,771, Cl. 325-404.000.

Mathis, Cleo D. Whirlpool jet for bathtubs. 3,946,449, Cl. 4-178.000.

Mathison, Ian William; Solomons, William Ebenezer; and Jones, Raymond Henry, to Marion Laboratories, Inc. 5 or 1′-Hydroxy-2-alkyl-7,8-cyclopentano[h]-1,2,3,4-tetrahydroisoquinolines and esters. 3,947,454, Cl. 260-287.0CF.

Matsui, Masanao; Horiuchi, Fukashi; Hirai, Hajime; and Itaya, Nobushige, to Sumitomo Chemical Company, Limited. Preparation of optically active allethrorone via allethronyl acid phthalate. 3,947,519, Cl. 260-586.00R.

Matsumoto, Kengo: *See—*
Saito, Makoto; Matsumoto, Kengo; and Hayakawa, Kiyonori, 3,947,891.

Matsuo, Koichi: *See—*
Murakami, Noboru; Hirosawa, Koichiro; Ohara, Kazuo; and Matsuo, Koichi, 3,946,622.
Murakami, Noboru; Matsuo, Koichi; Hirosawa, Koichiro; and Ohara, Kazuo, 3,946,623.
Murakami, Noboru; Hirosawa, Koichiro; Ohara, Kazuo; and Matsuo, Koichi, 3,946,624.

Matsuo, Masatoshi: *See—*
Akamatsu, Takashi; Koga, Koichi; Kondo, Mitsuru; Miyake, Makoto; Twasaki, Hiroshi; Matsuo, Masatoshi; Hotta, Seiji; Yuji, Isao; and Ito, Yukiaki, 3,947,471.

Matsuo, Tadao; Mori, Shuji; and Morimoto, Yoshiki, to Mitsuboshi Belting Ltd. Anionic process for the polymerization of lactam. 3,947,428, Cl. 260-78.00L.

Matsushita Electric Industrial Company, Ltd.: *See—*
Saito, Teruo; Seki, Hideki; and Hiroyasu, Mamoru, 3,947,892.
Suenami, Keniti; Shimizu, Kazuhiko; and Ogata, Kazuo, 3,947,721.
Takano, Kazuro; Hirata, Masakuni; and Kodera, Yasuo, 3,946,832.
Tanaka, Toshihide; Fujisawa, Seiji; and Ide, Susumu, 3,947,629.
Tanaka, Yutaka, 3,947,627.
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Matsushita, Tomiharu: *See—*
Yamasaki, Tatsuo; Ide, Hideaki; Yamaguchi, Yoshihiro; Matsushita, Tomiharu; and Nakahara, Yuuzi, 3,946,584.

Matter, Robert C.; and Spangler, Larry D., to General Motors Corporation. Process and apparatus for making intercell connectors by an extrusion-fusion technique. 3,947,290, Cl. 136-134.00R.

Matthias, Heinz-Bernd; Klepp, Christian; and Koll, Gunter, to Klein, Schanzlin & Becker Aktiengesellschaft. Lubricated thrust bearings for pump and motor units. 3,947,153, Cl. 417-365.000.

Matubara, Saburo: *See—*
Tsuchiya, Shozo; Murai, Yoshikazu; and Matubara, Saburo, 3,947,432.

Maurice, Louis, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Molecular vacuum pump structure. 3,947,193, Cl. 415-143.000.

Mauser, Francis P. Personal protection device using flashcubes. 3,947,221, Cl. 431-93.000.

Mauszahl, Dieter; and Wohlkonig, Alexander, to Ciba-Geigy AG. Fibre-reactive dyestuffs. 3,947,407, Cl. 260-239.0EQ.

Mayer, Edward Francis: *See—*
Buchan, William Raymond; Kulpan, James A.; and Mayer, Edward Francis, 3,947,113.

Mayer, William Norman: *See—*
Strom, Richard Albert; Mayer, William Norman; and Johnson, Robert Wallace, 3,947,722.

Mayn, Bobby G., to United States of America, Energy Research and Development Administration. Computer interactive resistance simulator (CIRS). 3,947,675, Cl. 235-184.000.

Mayston, Donald, to Protocol Engineering Limited. Methods of and apparatus for edge-forming metallic plates. 3,946,588, Cl. 72-465.000.

Mazzini, Anthony E. Automatic animal feeders. 3,946,702, Cl. 119-51.130.

MCA Disco-Vision, Inc.: *See—*
Jarsen, Manfred H., 3,947,888.

McArdle, Edward J.: *See—*
Bourgeois, Francis H.; and McArdle, Edward J., 3,946,535.

McCaffrey, David, to Gravure-Craft Ltd. Temporary sign for automobiles. 3,946,509, Cl. 40-129.00C.

McCartney, Ronald L., to International Telephone & Telegraph Corporation. Fiber optic connector with axial tolerance relief. 3,947,182, Cl. 350-96.00C.

McCord, Wilfred M., Jr., to Vermont American Corporation. Device for employing a motorized hand tool to cut a spiralled groove in a workpiece. 3,946,774, Cl. 142-26.000.

McCormack, William, to British Cast Iron Research Association. Apparatus for making sand-resin molds. 3,946,796, Cl. 164-200.000.

McCormick, Harold E.: *See—*
Prasse, Herbert F.; and McCormick, Harold E., 3,947,269.

McCready, John E., to Goodyear Tire & Rubber Company, The. Polyurethane polyvinylidene chloride composition. 3,947,403, Cl. 260-32.80N.

McDonnell Douglas Corporation: *See—*
Grossman, Jack J., 3,947,302.
Rice, Robert R.; and Burkhart, Gordon H., 3,947,780.

McElroy, Jerry W.: *See—*
Donnelly, Donald E.; McElroy, Jerry W.; and Ehlmann, Arlie H., 3,947,795.

McGarry, George: *See—*
Woods, Gilbert Frederick; Cairns, James; and McGarry, George, 3,947,478.

McGinley, Emanual J.; and Tolan, Francis H., to FMC Corporation. Edible jelly and method of preparing same. 3,947,604, Cl. 426-573.000.

McGinnis, Bernard W.; Orlando, Anthony W.; and Weidenhammer, James A., to International Business Machines Corporation. Restraint device for buckling a flexible magnetic disk stack upon partitioning. 3,947,885, Cl. 360-98.000.

McGlumphy, George F.: *See—*
Budway, Raymond J.; and McGlumphy, George F., 3,946,973.

McGrath, Ronald P.; and Bleher, William A., to General Instrument Corporation. Self-clocking NRZ recording and reproduction system. 3,947,878, Cl. 360-51.000.

McGregor, Stanley D.; and Senkbeil, Herman O., to Dow Chemical Company, The. Method for preparing 2,5-dihalo- and 2,5,6-trihalopyridines. 3,947,457, Cl. 260-290.0HL.

McGuire, James Daniel: *See—*
Allen, Francis Edwin; and McGuire, James Daniel, 3,946,634.

McGuire, John V.; and Mitchell, Robert L., to Xerox Corporation. Book having a security cover. 3,946,867, Cl. 206-450.000.

McKillop, Alexander: *See—*
Taylor, Edward C.; and McKillop, Alexander, 3,947,488.

McKinlay, Philip France: *See—*
Schultz, Ward Edward; Smith, Harry Davis, Jr.; and McKinlay, Philip France, 3,947,683.

McLain, Charles D., to Olin Corporation. Composite metal seals for use in rotary internal engines. 3,947,161, Cl. 418-113.000.

McLean, Robert E. Power operated can opener with power-pierce, automatic shutoff, and removable operating lever and cutter mounting plate assembly. 3,946,485, Cl. 30-4.00R.

McMaster, Harold A.; and Nitschke, Norman C. Roller hearth furnace for glass sheets. 3,947,242, Cl. 432-122.000.

McPherson, Gregg K.: *See—*
Marsh, Jeffrey D.; and McPherson, Gregg K., 3,946,482.

Mears, Adrian Leonard: *See—*
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Measurex Corporation: *See—*
Al-Shaikh, Al; and Dahlin, Erik B., 3,947,668.

Medalert Corporation: *See—*
Auerbach, Albert A., 3,946,744.

Medical Research Laboratories, Inc.: *See—*
Milani, Dean L.; and Kerwin, Richard G., 3,946,743.

Meguro, Kanji: *See—*
Kuwada, Yutaka; Tawada, Hiroyuki; and Meguro, Kanji, 3,947,417.

Mehnert, Johannes. Blow molding apparatus. 3,947,197, Cl. 425-324.00B.

Meijer, Robert S., to Multi-State Devices, Ltd. Analog memory system using a temperature sensitive device. 3,947,828, Cl. 340-173.00R.

Meinel, Helmut, to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.v. Method and arrangement for determining nitric oxide concentration. 3,947,685, Cl. 250-373.000.

Meinke, Hans; and Schumann, Fritz, to Schubert & Salzer Maschinenfabrik Aktiengesellschaft. Devices for handling unspun fibers. 3,946,464, Cl. 19-150.000.

Meisei Kagaku Kabushiki Kaisha: *See—*
Ito, Masatomo; Gotoh, Tsuneo; and Nishino, Shizuo, 3,947,389.

MEKOPHARMA Dr. Becker & Cie. K.G.: *See—*
Sioufy, Tamim El, 3,946,448.

Melcher, Robert Albert, to Siemag Siegener Maschinenbau GmbH. Apparatus for injection molding of bodies with a core and skin of different materials. 3,947,175, Cl. 425-130.000.

Meldahl, Kenneth R.: *See—*
Gornstein, Robert J.; and Meldahl, Kenneth R., 3,946,688.

Mendez, William M., to Oxy Metal Industries Corporation. Method for image alignment. 3,947,126, Cl. 356-150.000.

Menges, Hans George Ludwig; Harms, Engelbert Gerhard; and Lehnen, Josef Peter, to Uniroyal Aktiengesellschaft. Single worm extruder. 3,946,998, Cl. 259-191.000.

Menkel, John P., Jr.; and Metz, Stewart N., to Crane Carrier Company. Cab for waste collection vehicle. 3,946,885, Cl. 214-302.000.

Menmuir, John; and Faulkes, Kenneth Milford, to Lucas Aerospace Limited. Electric circuit-breaker apparatus. 3,947,859, Cl. 340-253.00B.

Mercier, Jacques H. Pressure vessel having a deformable bladder therein. 3,946,759, Cl. 138-30.000.

Merck & Co., Inc.: *See—*
Baldwin, John J.; and Novello, Frederick C., 3,947,577.
Christensen, Burton G.; and Ratcliffe, Ronald W., 3,947,413.
Hirschmann, Ralph F., 3,947,409.
Shen, Tsung-Ying; Li, Jorge P.; and Dorn, Conrad P., Jr., 3,947,582.

Merino, Dennis H.: *See—*
Goldfarb, Adolph E.; Benkoe, Erwin; and Merino, Dennis H., 3,947,030.

Merman, Richard J. Granulated material dispenser. 3,946,913, Cl. 222-453.000.

Mertz, Richard E.; and Lissant, Kenneth J., to Petrolite Corporation. System for producing emulsions. 3,946,994, Cl. 259-7.000.

Messersmith, Robert Earl, to Hoffmann-La Roche Inc. Method of combatting swine dysentery. 3,947,586, Cl. 424-283.000.

Metal Box Limited: *See—*
Bell, George; Rance, David G.; and Raxworthy, Sydney, 3,946,930.

Metal Marine Pilot, Inc.: *See—*
Freeman, Robert M., 3,946,691.

Metcalfe, Kenneth Archibald; and Wilson, Clive Westgarth, to Commonwealth of Australia, The. Electrostatic offset printing. 3,946,671, Cl. 101-426.000.

Meth-Cohn, Otto: *See—*
Clarke, James A.; and Meth-Cohn, Otto, 3,947,336.

Methode Electronics, Inc.: *See—*
Tesch, Charles L., 3,947,729.

Metz, Stewart N.: *See—*
Menkel, John P., Jr.; and Metz, Stewart N., 3,946,885.

Meyer, Hans-Rudolf, to Ciba-Geigy Corporation. New bis-oxadiazole compounds. 3,947,410, Cl. 260-240.00D.

Meyerle, George M., to B.S.R. (U.S.A.) Ltd. Telephone answering system and apparatus. 3,947,642, Cl. 179-6.00R.

Meynier, Maurice J., III, to Cameron Iron Works, Inc. Ram-type blowout preventer. 3,946,806, Cl. 166-55.000.

Michael, Dana U.: *See—*
Swered, Paul; and Michael, Dana U., 3,947,581.

Michael, Jeffrey: *See—*
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Michel, Eberhard: *See—*
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Michel, Frank; and Ruffini, Egidio J., to Westinghouse Electric Corporation. Gas turbine stationary shroud seals. 3,947,145, Cl. 415-217.000.

Miedtank, Sighart; Ruffer, Adam; and Galster, Hans, to Hoechst Aktiengesellschaft. Process for the preparation of pure, aromatic o-hydroxy-carboxylic acid aryl amides. 3,947,515, Cl. 260-559.00S.

Mietz, Raymond E.: *See—*
Hartman, William H.; Mietz, Raymond E.; Peschke, John R.; and Ruge, Donald H., 3,947,255.

Mikawa, Akikazu; Horie, Ikutaro; Adachi, Keiichi; and Shiraishi, Hisashi, to Fuji Photo Film Co., Ltd. Silver halide photographic material containing an isourea derivative as antifoggant. 3,947,274, Cl. 96-107.000.

Mikheev, Vikenty Pavlovich: *See—*
Bark, Semen Efimovich; Garkusha, Ivan Semenovich; Kafyrin, Jury Pavlovich; Kreinin, Efim Vulfovich; Fedorov, Nikolai Ananievich; Shulyak, Vladimir Fedorovich; Khaitin, Alexandr Alexandrovich; Alexandrov, Sergei Gavrilovich; Bobrov, Marat Mikhailovich; Goman, Vyacheslav Grigorievich; Ermolaev, Viktor Sergeevich; Leonov, Sergei Vladimirovich; and Mikheev, Vikenty Pavlovich, 3,946,719.

Mikiver, Lembit: *See—*
Jonsson, Nils Ake; Mikiver, Lembit; and Moses, Pinchas, 3,947,451.

Mikstais, Uldis Yanovich: *See—*
Perekalin, Vsevolod Vasilievich; Sopova, Alexandra Semenovna; Zobacheva, Maiva Mikhailovna; Spunde, Rasma Yanovna; Mikstais, Uldis Yanovich; and Silaya, Maiya Petrovna, 3,947,492.

Milani, Dean L.; and Kerwin, Richard G., to Medical Research Laboratories, Inc. Defibrillating electrode. 3,946,743, Cl. 128-404.000.

Milbar Corporation: *See—*
Martin, George G.; and Jones, Alvin J., 3,946,456.

Milkovic, Miran, to General Electric Company. C-MOS electronic kWh meter and method for metering electrical energy. 3,947,763, Cl. 324-142.000.

Miller, Frank R.; Andreiko, Craig A.; and Di Giulio, John H. Removable orthodontic appliance. 3,946,488, Cl. 32-14.00B.

Miller, George E.: *See—*
Hackbarth, Eugene R.; Miller, George E.; Petersen, H. Norman; Sheldon, John D.; and Ward, Harry M., III, 3,946,697.

Miller, Howard A., to Eastman Kodak Company. Electrophotographic developing compositions. 3,947,370, Cl. 252-62.10P.

Miller, Kenneth H.: *See—*
LaFollette, Robert L.; and Miller, Kenneth H., 3,946,698.
LaFollette, Robert L.; and Miller, Kenneth H., 3,946,841.

Millipore Corporation: *See—*
Grandine, Joseph D.; Marsh, Nat H.; and Snyder, James E., 3,947,345.

Milner, Edwin Earl, Jr. Lightweight high strength boom construction. 3,947,191, Cl. 403-334.000.

Minert, Roy T.: *See—*
Adams, Gary V.; Minert, Roy T.; and Thurston, James R., 3,946,672.

Minolta Camera Kabushiki Kaisha: *See—*
Hamaguchi, Hiroshi; and Tanaka, Atsuyuki, 3,947,106.
Hamaguchi, Hiroshi, 3,947,115.
Tanaka, Susumu; Enoguchi, Yuji; and Kawabata, Hidetoshi, 3,947,019.

Mirshak, Richard C., to Lawrence Peska Associates, Inc., a part interest. Automatic flag storage and display device. 3,946,699, Cl. 116-174.000.

Misato, Tomomasa; Huang, Keng Tang; Homma, Yasuo; Kanao, Seizo; Toyoda, Takeshi; Suyama, Tadashi; and Shida, Toshiro, to Rikagaku Kenkyusho; and Ajinomoto Co. Ltd. Fungicidal methods employing amino acid derivatives. 3,947,589, Cl. 424-319.000.

Mishler, Rodger B.: *See—*
Kutney, John T.; and Mishler, Rodger B., 3,946,830.

Mita Industrial Company Limited: *See—*
Washio, Takaji; Sasaki, Koichi; Iida, Kazumi; Iseki, Masahide; and Aizawa, Tatsuo, 3,947,114.

Mitchell, David S., to Chevron Research Company. Process for removing metalliferous contaminants from hydrocarbons. 3,947,347, Cl. 208-251.00H.

Mitchell, Jack H., Jr. Process for making flavorless food extenders derived from peanuts, and a method of recovering peanut oil. 3,947,599, Cl. 426-250.000.

Mitchell, Robert L.: *See—*
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Mitoff, Stephan P.: *See—*
Breiter, Manfred Wolfgang; Mitoff, Stephan P.; and Powers, Robert W., 3,946,751.

Mitrowsky, Alexander; Klappert, Helmut; Zenner, Karl-Friedrich; and Hagen, Wilhelm, to Bayer Aktiengesellschaft. Continuous prephosgenation process for the production of organic isocyanates. 3,947,484, Cl. 260-453.0PH.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Saita, Toshikazu, 3,946,708.

Mitsubishi Gas Chemical Company Inc.: *See—*
Hozumi, Yukio; Ohi, Akira; Toga, Yuzo; Yoshizaki, Hiroyuki; Takanohashi, Hiromitsu; and Masuda, Yoshitaka, 3,947,524.
Sato, Shunichi; Tanigaichi, Mineaki; and Iwasawa, Kazuyoshi, 3,947,393.

Mitsuboshi Belting Ltd.: *See—*
Matsuo, Tadao; Mori, Shuji; and Morimoto, Yoshiki, 3,947,428.

Mitsui Mining & Smelting Co., Ltd.: *See—*
Kojima, Hiromitsu; and Yoshida, Kimio, 3,946,854.

Mitsui Shipbuilding & Engineering Co. Ltd.: *See—*
Nakase, Noriaki; and Nagamine, Yoshiaki, 3,947,326.

Miyake, Makoto: *See—*
Akamatsu, Takashi; Koga, Koichi; Kondo, Mitsuru; Miyake, Makoto; Twasaki, Hiroshi; Matsuo, Masatoshi; Hotta, Seiji; Yuji, Isao; and Ito, Yukiaki, 3,947,471.

Miyake, Nobuo, to Totsu Co. Ltd. System for conducting a television audience survey. 3,947,624, Cl. 178-6.000.

Miyamoto, Mitsunori, to Kokusan Denki Co., Ltd. Flywheel type magneto generator for a rotary engine. 3,947,710, Cl. 310-153.000.

Miyazaki, Ken; Kubota, Narumi; Igarashi, Kooichi; Sato, Hiroshi; Takahashi, Kazutoshi; Maki, Takeshi; Hatano, Akira; and Kai, Masamitsu, to Asahi Kasei Kogyo Kabushiki Kaisha. Liquid detector. 3,946,625, Cl. 73-61.10R.

Miyoshi, Hitoshi, to Fuji Photo Film Co., Ltd. Apparatus for generating signals corresponding to characters to be displayed. 3,947,844, Cl. 340-380.000.

Mize, Erbie Gail, to Astec Industries, Inc Closure gate apparatus having material flow guiding structure. 3,946,772, Cl. 141-98.000.

Mizukami, Takashi; and Mouri, Takuo, to Pioneer Electronic Corporation. Demultiplexer for FM stereophonic receivers. 3,947,645, Cl. 179-15.0BT.

Moertel, George B., to Textron Inc. Stringer for a slide fastener. 3,946,465, Cl. 24-205.10C.

Mohr, John Gilbert: *See—*
Van Gunten, Paul Richard; and Mohr, John Gilbert, 3,946,957.

Mohr, Reinhard: *See—*
Fleckenstein, Erwin; Heinrich, Ernst; and Mohr, Reinhard, 3,947,463.

Moldex/Metric, Inc.: *See—*
Magidson, Herbert; Huber, Otto L.; and Hennrich, Helmuth, 3,947,207.

Molins Machine Company, Inc.: *See—*
Evans, Donald J., 3,946,800.

Monahan, Jack J.: *See—*
Bahnck, Norman; Booth, Raymond H.; Boyer, John A.; and Monahan, Jack J., 3,946,931.

Monarch Tool & Manufacturing Company: *See—*
Hall, Mitchell A., 3,946,849.

Monpetit, Louis. Apparatus for controlling transient occurrences in an electronic fuel injection system. 3,946,704, Cl. 123-32.0EA.

Monpetit, Louis, to Societe des Procedes Modernes d'Inject Sopromi. Tachometric and angular programming system for rotary device. 3,946,709, Cl. 123-117.00R.

Monsanto Company: *See—*
Craford, Magnus George; and Bailey, Paul T., 3,947,840.
Gomez, I. Luis, 3,947,431.
Iqbal, Abul F. M., 3,947,458.
Rakestraw, Lawrence F., 3,946,794.

Monter, Robert Paul, to NDM Corporation. Biomedical electrode assembly. 3,946,730, Cl. 128-2.06E.

Montuelle, Jean: *See—*
Kinh, Vu Quang; and Montuelle, Jean, 3,947,331.

Moody, Roy A.: *See—*
Caveney, Jack E.; Moody, Roy A.; Fulton, Ronald T.; and Rehling, Charles J., 3,946,769.

Moon, Jacob R., to Moon Water Saver, Inc. Auxiliary water saving attachment for water closets. 3,946,447, Cl. 4-1.000.

Moon Water Saver, Inc.: *See—*
Moon, Jacob R., 3,946,447.

Moore, Robert Milton: *See—*
Busanovich, Charles John; Fischer, John Theodore; Moore, Robert Milton; and van Raalte, John A., 3,947,717.

Moore, William Philip: *See—*
Thunberg, Jon Carl; Bragdon, Robert Wright; and Moore, William Philip, 3,947,496.

Morane, Bruno P.; and Sigaudo, Giuseppe, to L'Oreal. Cap for operating dispensing valve which may be actuated from a plurality of directions. 3,946,911, Cl. 222-402.110.

Morelli, Morello; and De Marco, Fortunato, to Snamprogetti S.p.A. Hydrogenation of linear hydrocarbon diolefins to linear hydrocarbon olefins. 3,947,510, Cl. 260-677.00H.

Morgan, Jack R., to Motorola, Inc. Circuit for converting alternating current voltages to a constant magnitude direct current voltage. 3,947,752, Cl. 323-17.000.

Morgan, Walter A.: *See—*
Buntin, Robert R.; and Morgan, Walter A., 3,947,537.

Mori, Eiji; Okada, Kozo; and Ueno, Saburo, to Nippon Tokushu Togyo Kabushiki Kaisha. Ultrasonic device. 3,946,829, Cl. 181-142.000.

Mori, Kenjiro: *See—*
Sagawa, Seiji; Nakagawa, Tsunehiko; Yoshida, Osamu; Mori, Kenjiro; and Ebisutani, Junichi, 3,947,429.

Mori, Shuji: *See—*
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Morimoto, Yoshiki: *See—*
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Morlin, Andras, to "Futober" Epuletgepeszeti Termekeket Gyarto Vallalat. Suction-mixing head provided with swirl chamber. 3,946,993, Cl. 259-4.00R.

Morota, Masaaki: *See—*
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Moss, Robert H.; and Spicuzza, William F., to Harshaw Chemical Company, The. Process for preparing pure barium nitrate crystals. 3,947,553, Cl. 423-395.000.

Motorengabrik Hatz KG.: *See—*
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Mottier, Francois, to BBC Brown, Boveri & Company, Limited. Method of producing a hologram with an orthoscopic image. 3,947,085, Cl. 350-3.500.

Moultrie, Charles W., to Saratore, Marie, a part interest. Rear view vision device. 3,947,095, Cl. 350-302.000.

Mouri, Takuo: *See—*
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Mulakala, Maieshrao. Encapsulated tube dispensing unit. 3,946,904, Cl. 222-102.000.

Mulder, Roland J. Taper lock bolt remover. 3,946,481, Cl. 29-252.000.

Muller, Hans Rudolf: *See—*
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Muller, Jakob, to Patax Trust Reg. Shuttleless web weaving machine. 3,946,767, Cl. 139-122.00H.
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Muncheryan, Hrand M. Automobile emergency-alerting system. 3,947,815, Cl. 340-88.000.
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Munzel, Howard E.; and Queener, Carl A., to International Business Machines Corporation. Electrostatic imaging method using a polytetrafluoroethylene coated carrier particle. 3,947,271, Cl. 96-1.0SD.
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Murakami, Noboru; Matsuo, Koichi; Hirosawa, Koichiro; and Ohara, Kazuo, to Aisin Seiki Kabushiki Kaisha. Speed change gear system. 3,946,623, Cl. 74-765.000.
Murakami, Noboru; Hirosawa, Koichiro; Ohara, Kazuo; and Matsuo, Koichi, to Aisin Seiki Kabushiki Kaisha. Speed change gear. 3,946,624, Cl. 74-769.000.
Murakami, Noboru; Hirozawa, Koichiro; and Takahashi, Shigeo, to Aisin Seiki Kabushiki Kaisha. Hydraulic modulator valve. 3,946,760, Cl. 138-31.000.
Murib, Jawad H.; Frank, Charles E.; and Seeskin, Ben, to National Distillers and Chemical Corporation. Process for the preparation of acrylic and methacrylic acids. 3,947,495, Cl. 260-533.00N.
Murphy, John H.; and Lieberman, George, to Lanvin-Charles of the Ritz, Inc. Lipstick containing microencapsulated oils. 3,947,571, Cl. 424-64.000.
Murray, Joseph E., Jr., to Polaroid Corporation. Photographic film drive system employing inertia dumper. 3,947,187, Cl. 352-72.000.
Musa, Fuad H.: *See—*
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Musto, Michael, to Lawrence Peska Associates, Inc., a part interest. Tire changing machine improvement. 3,946,786, Cl. 157-1.240.
Muterel, Roland, to Societe Anonyme D.B.A. Brake pressure imbalance switch. 3,947,648, Cl. 200-82.00D.
Muxfeldt, Hans H.; and Michael, Jeffrey, to Research Corporation. Stereoselective introduction of tetracyclines hydroxyl group at 12(a) position in synthesis of tetracyclines. 3,947,517, Cl. 260-559.0AT.
Myers, Daryl Lester, to Western Electric Company, Inc. Apparatus for extruding plastic materials. 3,947,172, Cl. 425-113.000.
Myers, John L.; Lasher, Richard W.; and James, Russell D., to Union Carbide Corporation. Pigmented asbestos coating systems. 3,947,286, Cl. 106-286.000.
Myers, Robert F., to Pfizer Inc. Decarbonylation of quinoxalines. 3,947,438, Cl. 260-250.0QN.
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Nakano, Toyomichi, to Canon Kabushiki Kaisha. Utterance training machine. 3,946,504, Cl. 35-35.00C.
Nakase, Noriaki; and Nagamine, Yoshiaki, to Mitsui Shipbuilding & Engineering Co. Ltd. Vertical tube type cracking furnace. 3,947,326, Cl. 196-110.000.
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Negrevergne, Georges, to Societe Anonyme Cortial S. A. Analgesics obtained by reacting a primary amine and an aldehyde. 3,947,587, Cl. 424-285.000.
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Nelmark, Jack D., to Bucyrus-Erie Company. Drill shock absorber. 3,947,009, Cl. 267-137.000.
Nelson, David V., to Caterpillar Tractor Co. Reversible track link with replaceable rail and method. 3,947,074, Cl. 305-54.000.
Nelson, Philip Henry. Descending bed of sub-divided solid material. 3,947,239, Cl. 432-14.000.
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Neumaier, Robert, to Van Leer Verpackungen GmbH. Apparatus for combined injection moulding and blow forming of containers or objects form plastics material. 3,947,180, Cl. 425-242.00B.
Neumann, Ernst-Georg; Tewes, Giesbert; and Bader, Alfons, to Krupp-Koppers GmbH. Combustion system. 3,947,226, Cl. 431-114.000.
Neumann, Gerhard, to General Electric Company. Variable pitch turbofan engine and a method for operating same. 3,946,554, Cl. 60-204.000.
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Neward, Theodore C. Respirator assist device. 3,946,736, Cl. 128-278.000.
Newcomb, Clive Victor, to U.S. Philips Corporation. Magnetic core assemblies with adjustable reluctance as a function of temperature. 3,947,794, Cl. 335-217.000.
Newport News Shipbuilding and Drydock Company: *See—*
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Newton, David W.; and Adan, John M. Leakage current cancelling circuit for use with electrosurgical instrument. 3,946,738, Cl. 128-303.140.
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Nicholas, David C.; Torgrim, Willard J.; and Kleitsch, John C., to Rockwell International Corporation. Selective switching apparatus. 3,947,639, Cl. 179-1.0CN.
Nichols, Duane C.; and Pearson, Samuel J., to Whirlpool Corporation. Electrical diagnostic system for refrigeration apparatus. 3,946,573, Cl. 62-126.000.
Nichols, Herbert F., to Bauman, Joel. Dual function electronic circuit. 3,947,750, Cl. 323-1.000.
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Nisley, Irvin A.; and Kuhl, James R., to Bangor Punta Operations, Inc. Roof safety latch. 3,947,066, Cl. 296-27.000.
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Odioso, Raymond C.; Riley, William T.; and Jones, David A., to Drackett Company, The. Dispensing container and refill for an air treating gel. 3,946,945, Cl. 239-58.000.
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Oger, Jacques Francois, to Pont-A-Mousson S.A. Voussoir for a lining, and method for constructing the lining. 3,946,567, Cl. 61-45.00R.
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Ohshima, Iwao; Chiba, Seiichi; Ariyama, Kenzo; Ogawa, Yasuo; and Ozaki, Masahide, to Nitto Kagaku Kogyo Kabushiki Kaisha. Process for purifying acrylamides. 3,947,518, Cl. 260-561.00N.
Oka, Hideaki: *See—*
Kyo, Sunao; Oka, Hideaki; Hayashi, Katsuhiko; and Tanaka, Hidetsugu, 3,947,504.
Okada, Kozo: *See—*
Mori, Eiji; Okada, Kozo; and Ueno, Saburo, 3,946,829.
Okada, Takeshi; and Kanehira, Katsuyuki, to Olympus Optical Co., Ltd. Flexible tube assembly for an endoscope. 3,946,727, Cl. 128-4.000.
Okeley, Robert E., II: *See—*
Cerny, Daryl D.; Cannon, Robert W.; Okeley, Robert E., II; and Sannella, Joseph L., 3,946,670.
Okun, Svetlana Alexandrovna: *See—*
Epaneshnikova, Valentina Evgenievna; Kondratskaya, Evgenia Alexandrovna; Primak, Grigory Karpovich; Umantsev, Viktor Sergeevich; and Okun, Svetlana Alexandrovna, 3,947,799.
Okuno, Yasuo: *See—*
Nishizawa, Jun-Ichi; Suto, Ken; and Okuno, Yasuo, 3,947,548.
Oldenburg, Dorrance; and Fischer, Robert L., to Caterpillar Tractor Co. Dual shear blade assembly. 3,946,776, Cl. 144-34.00E.
Oler, Ernst Bertil, to AB Bofors. Driving and steering device for a loading platform. 3,946,823, Cl. 180-23.000.
Olin Corporation: *See—*
McLain, Charles D., 3,947,161.
Schaffling, Otto G., 3,947,523.
Oliver, Floyd F.: *See—*
Duffek, Edward F.; Funk, Ernest J.; Jankowski, Alfred S.; Lane, Jack C.; Lehner, William L.; Oliver, Floyd F.; and Schneider, Mark R., 3,947,867.
Oliver, Theodore A., to Reliance Electric Company. Pulsed power supply. 3,947,738, Cl. 318-341.000.
Olofsson, Hans Kristoffer, to Atlas Copco Aktiebolag. Screw rotor machine with axially balanced hollow thread rotor. 3,947,163, Cl. 418-203.000.
Olsaker, Oleif, to Sullair Corporation. Rotary screw machine with rotor thrust load balancing. 3,947,078, Cl. 308-207.00R.
Olson, Charles W., to United States of America, Navy. Range-bearing computer. 3,947,804, Cl. 340-6.00R.
Olympus Optical Co., Ltd.: *See—*
Okada, Takeshi; and Kanehira, Katsuyuki, 3,946,727.
Saito, Shoichi, 3,947,646.
Omark Industries, Inc.: *See—*
Grey, Frederick R., 3,946,636.
Ondetti, Miguel A., to E. R. Squibb & Sons, Inc. Peptides as argiotensin converting enzyme inhibitors. 3,947,575, Cl. 424-177.000.
Ono, Takamichi, to Takashi Tumura. Hair dryer with a vapor ejection means. 3,947,659, Cl. 219-362.000.
Onoda Cement Co., Ltd.: *See—*
Fukuda, Yoshiharu; and Ueda, Yoshihiko, 3,947,238.
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Oppenlaender, Knut: *See—*
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Oregon Graduate Center for Study and Research: *See—*
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Orlando, Anthony W.: *See—*
McGinnis, Bernard W.; Orlando, Anthony W.; and Weidenhammer, James A., 3,947,885.
Oroshnik, William, to SCM Corporation. Vitamin A intermediates. 3,947,498, Cl. 260-611.00V.
Ortega, Michael. Food for sea life comprising homogenized mixture of sea urchin eggs and sodium sulfite preservative. 3,947,601, Cl. 426-330.100.
Osborn, Leroy Gordon; and Brownlee, George Hunnam, to Westrex Company Limited. Mechanical drive arrangements. 3,947,101, Cl. 352-187.000.
Osdor, Asriel. Method and apparatus for drying moisture-containing solids particularly domestic refuse and sludge cakes. 3,946,495, Cl. 34-15.000.
Ostrovsky, Viktor Julievich: *See—*
Bolshov, Vladimir Mikhailovich; Voinov, Vyacheslav Evgenievich; Kletskin, Solomon Zalmanovich; Ostrovsky, Viktor Julievich; Soloviev, Valery Vladimirovich; and Ter-Kasparova, Nina Yakovlevna, 3,946,725.
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Ott, Douglas E.: *See—*
Harrison, Raymond E.; Kiss, Marvin L.; and Ott, Douglas E., 3,947,672.
Ott, John Nash, to John Ott Laboratories, Inc. Filtered fluorescent lamp. 3,947,719, Cl. 313-489.000.
Otubo, Osamu; Tatsuno, Yujiro; Ikeda, Takatoshi; and Tsubaki, Toshio, to Hitachi, Ltd. Electrophotographic apparatus for recording images in superimposed relationship. 3,947,190, Cl. 355-3.00R.
Ours, Carroll Wayne: *See—*
Kyncl, Jaroslav; Lynn, Kathleen Riley; Martin, Yvonne Connolly; and Ours, Carroll Wayne, 3,947,590.
Ours, Frank M. Ventilated plant protector. 3,946,521, Cl. 47-28.00R.
Outboard Marine Corporation: *See—*
Hackbarth, Eugene R.; Miller, George E.; Petersen, H. Norman; Sheldon, John D.; and Ward, Harry M., III, 3,946,697.
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Rapp, James E., 3,947,089.
Salisbury, Charles W., 3,947,260.
Oxy Metal Industries Corporation: *See—*
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P. R. Mallory & Co., Inc.: *See—*
Dey, Arabinda; N.; and Sullivan, Bernard P., 3,947,289.
Padegs, Andris; and Smith, Ronald Morton, to International Business Machines Corp. Means for coordinating asynchronous main store accesses in a multiprocessing system using virtual storage. 3,947,823, Cl. 340-172.500.
Page, Paul N., administrator: *See—*
Arvanitis, Aristotelis; Malinowski, Stanley; Smith, Craig P., deceased; and Page, Paul N., administrator, 3,947,784.
Paget, Pierre Charles, to Essilor International "Compagnie Generale d'Optique". Light projector device, particularly for eyesight examination tests. 3,947,098, Cl. 351-30.000.
Pailler, Yves. Rotary machines comprising four cylinders in a star. 3,946,706, Cl. 123-56.0BC.
Pallos, Ferenc M.: *See—*
DeBaun, Jack R.; Pallos, Ferenc M.; and Baker, Don R., 3,947,475.
Palomo Coll, Antonio Luis. 3-Alkylsilyl-2-oxazolidonone compounds and synthesis thereof. 3,947,465, Cl. 260-307.00C.
Panduit Corporation: *See—*
Caveney, Jack E.; Moody, Roy A.; Fulton, Ronald T.; and Rehling, Charles J., 3,946,769.
Panella, Edward A., to United States of America, Navy. Apparatus for measuring chamber pressure. 3,946,607, Cl. 73-167.000.
Panteleimonov, Vladimir Mikhailovich: *See—*
Ryss, Jury Samuilovich; Bakhtin, Jury Grigorievich; Chamaev, Viktor Nikolaevich; and Panteleimonov, Vladimir Mikhailovich, 3,947,756.
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Papenfuhs, Theodor: *See—*
Gengnagel, Kurt; Papenfuhs, Theodor; and Zimmermann, Manfred, 3,947,512.
Hunger, Klaus; and Papenfuhs, Theodor, 3,947,516.
Paper Converting Machine Company: *See—*
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Pappas, Penelope R.; and Parker, Dane K., to Goodyear Tire & Rubber Company, The. Aqueous preparation of sulfenamides. 3,947,459, Cl. 260-293.570.
Pareja, Ramon: *See—*
Sadler, Harry J.; Pareja, Ramon; and Leschisin, John, 3,947,157.
Parent, Richard A.; and Thomas, H. Ronald, to Xerox Corporation. Developer material with poly(p-xylylene) coated carrier. 3,947,371, Cl. 252-62.10P.
Parikh, Indu: *See—*
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Parker, Carol. Collapsible, spirally fluted container. 3,946,903, Cl. 222-92.000.
Parker, Clair F., Jr.: *See—*
Gershberg, David N.; Lee, Alex Y.; and Parker, Clair F., Jr., 3,947,834.
Parker, Dane K.: *See—*
Pappas, Penelope R.; and Parker, Dane K., 3,947,459.
Parker, Gary D. Bale handling apparatus. 3,946,887, Cl. 214-653.000.
Parker-Hannifin Corporation: *See—*
Bragg, Kenneth R., 3,946,572.
Ulanovsky, Jack M., 3,946,755.
Parker, Peter Robert, to Cincinnati Milacron Inc. Circuit for determining tool axis offset compensation. 3,947,667, Cl. 235-151.110.
Parker, Phillip H., to Chevron Research Company. Extra-wide nonwoven sheets. 3,947,310, Cl. 156-289.000.
Parrilla, Salvatore C. Method of tying a necktie. 3,946,444, Cl. 2-144.000.
Parrish, David Richard: *See—*
Scott, John William; Parrish, David Richard; and Saucy, Gabriel, 3,947,473.
Parrish, Roger W., to Benfield Corporation, The. Ammonia synthesis. 3,947,551, Cl. 423-359.000.
Parsons, Donald S.: *See—*
Ritsko, Joseph E.; and Parsons, Donald S., 3,947,616.
Particle Data, Inc.: *See—*
Russell, Dennis, Jr., 3,947,701.
Passauer, Hermann; and Hubel, Roland, to Bayern-Chemie. Fuel for generation of nontoxic propellant gases. 3,947,300, Cl. 149-35.000.
Patax Trust Reg.: *See—*
Muller, Jakob, 3,946,767.

Pate, Oscar Glenn; and Lyons, Angus Loughlin, Jr., to Dresser Industries, Inc. Service module for hostile environment. 3,946,571, Cl. 61-69.00R.

Patent and Inventions Ltd.: *See—*
Nussbaumer, Thomas, 3,946,999.

Paton, John Malloy: *See—*
Cottrell, Arnold George; and Paton, John Malloy, 3,947,365.

Patt, Jacob. Liquid applicator for ultra-sonic transducer. 3,946,599, Cl. 73-71.5US.

Patton, James C., Jr.: *See—*
Vanderpool, Clarence D.; Patton, James C., Jr.; Kim, Tai K.; and MacInnis, Martin B., 3,947,332.

Payne, Viron E., to Viron E. Payne, Inc. Digital transducers. 3,947,692, Cl. 250-577.000.

Peacey, John Gilleran: *See—*
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Pearson, Allen L.: *See—*
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Pearson, Samuel J.: *See—*
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Pechmeze, Jacques Pierre Edmond; Sureau, Robert Frederic Michel; and Brouard, Claude Marie Henri Emile, to Produits Chimiques Ugine Kuhlmann. Disazo acid compounds containing one sulphonic acid group and one phosphonic or methyl-phosphinic acid group. 3,947,435, Cl. 260-190.000.

Peckinpaugh, Frank Lee; Prior, Duane Rae; and Benton, Kenneth Roberts, to Allied Chemical Corporation. Printer to identify wound yarn packages being automatically doffed from winder. 3,946,664, Cl. 101-41.000.

Pedersen, Alec. Mono-ski. 3,947,049, Cl. 280-11.13S.

Peets, Robert Seymour: *See—*
Cowdrey, Roy Melvin; and Peets, Robert Seymour, 3,946,682.

Pekau, Dietlind: *See—*
Ruell, Hartwig; Pekau, Dietlind; and Eschler, Hans, 3,947,640.

Pelat, Patrice, to Vibrachoc. Shock and vibration insulator. 3,947,007, Cl. 267-136.000.

Pelser, Johannes C. H.: *See—*
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Penetryn System, Inc., The: *See—*
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Pennsylvania Crusher Corporation: *See—*
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Pennwalt Corporation: *See—*
Schuster, Ludwig K.; and Tongyai, Singkata, 3,947,397.

Pensak, Philip; and Januszewski, Joseph P., to Colgate-Palmolive Company. Oral product. 3,947,570, Cl. 424-54.000.

Pepiciello, Anthony J.; and Hrabec, Charles. Newspaper dispenser. 3,946,846, Cl. 194-1.00A.

Perdue, Stanley: *See—*
Hecht, Robert F.; and Perdue, Stanley, 3,947,199.

Perekalin, Vsevolod Vasilievich; Sopova, Alexandra Semenovna; Zobacheva, Maiva Mikhailovna; Spunde, Rasma Yanovna; Mikstais, Uldis Yanovich; and Silaya, Maiya Petrovna. Process for producing β-phenyl-γ-amino butyric acid hydrochloride. 3,947,492, Cl. 260-518.00R.

Perger, Bruce: *See—*
Fraser, Donald L., Jr.; and Perger, Bruce, 3,947,716.

Perilhou, Jean Robert; Simeon, Michel Jacques; and Taupin, Dominique Yves Marie, to U.S. Philips Corporation. Method of recording cinematographic images from an electric signal produced by scanning image sequences to be displaced and device for carrying out this method. 3,947,626, Cl. 178-6.60R.

Personal Communications, Inc.: *See—*
Waly, Adnan; and Yevick, George J., 3,947,104.

Peschke, John R.: *See—*
Hartman, William H.; Mietz, Raymond E.; Peschke, John R.; and Ruge, Donald H., 3,947,255.

Peterman, Charles P., to Hydril Company. Underwater connections at well head locations. 3,946,805, Cl. 166-.600.

Petermann, James P.; Dolinar, William E.; and Ehrlich, Stanley V., to Georgia Pacific Corporation. Machine for manufacturing articles of folded plasterboard. 3,947,014, Cl. 270-84.000.

Peters, Gerret M., Jr.; Stuber, Fred A.; and Ulrich, Henri, to Upjohn Company, The. α,ω-Diarylpolyene photosensitizers for sulfonylazide polymers. 3,947,337, Cl. 204-159.150.

Petersen, Daniel R., to Ex-Cello-O Corporation. Cutting tools. 3,946,473, Cl. 29-96.000.

Petersen, H. Norman: *See—*
Hackbarth, Eugene R.; Miller, George E.; Petersen, H. Norman; Sheldon, John D.; and Ward, Harry M., III, 3,946,697.

Peterson, Carl W., to International Telephone & Telegraph Corporation. Low insertion force circular electrical connector. 3,947,081, Cl. 339-75.00M.

Peterson, George R., to United States of America, Energy Research and Development Administration. Brazing graphite to graphite. 3,946,932, Cl. 228-121.000.

Peterson, Richard W.; Carpenter, L. Graydon; and Kastelic, Raymond, to Aluminum Company of America. Fume Flare. 3,947,215, Cl. 431-5.000.

Petrasek, Stephen Edward; and Cooke, Charles Steven, to Firestone Tire & Rubber Company, The. Pneumatic tire with light reflective elements. 3,946,782, Cl. 152-330.00R.

Petrikat, Klaus Rudiger: *See—*
Hille, Peter Michael; and Petrikat, Klaus Rudiger, 3,947,735.

Petrolite Corporation: *See—*
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Petta, John M.: *See—*
Brenner, L. Martin; Petta, John M.; and Ross, Stephen T., 3,947,470.

Pettersson, Henry Gustaf Erland; Skagerlund, Lars-Erik; and Stalfors, Rolf Lennart, to AB Bofors. Carrying part forming a projectile. 3,946,674, Cl. 102-70.20P.

Peyser, Leonard F., to Machlett Laboratories, Inc., The. Radiation limiting means. 3,947,690, Cl. 250-513.000.

Pfahl, Robert C., Jr., to Western Electric Company, Inc. Method and apparatus for generating a vapor for soldering fusing or brazing articles. 3,947,240, Cl. 432-28.000.

Pfizer Inc.: *See—*
Myers, Robert F., 3,947,438.

Phadtare, Pratap G.: *See—*
Kohrman, Robert E.; and Phadtare, Pratap G., 3,947,247.

Philipp, Albert: *See—*
Ehlebracht, Horst; and Philipp, Albert, 3,946,979.

Philippaerts, Herman Adelbert: *See—*
Pollet, Robert Joseph; Philippaerts, Herman Adelbert; Sels, Francis Jeanne; and Schelfaut, Francois Leon, 3,947,273.

Phillips Petroleum Company: *See—*
Witt, Donald R., 3,947,433.

Phoceenne Sous Marine - PSM Les Hommes Grenouilies Du Port De Marseille: *See—*
Sierra, Charles; and Pince, Pierre, 3,946,692.

Phoenix Research Inc.: *See—*
Bates, Barstow; and Ishler, Norman H., 3,947,568.
Berg, Robert C., Jr.; Ishler, Norman H.; and Jellema, Joseph, 3,947,567.
Sarna, Edward J.; Ishler, Norman H.; and Jellema, Joseph, 3,947,566.

Piccone, Dante E.: *See—*
DeCecco, Angelo L.; Demarest, Donald M.; Piccone, Dante E.; and Somos, Istvan, 3,947,726.

Picoy, Anthony R.; and Santos, Osvaldo. Safety cap for pressurized bottles. 3,946,891, Cl. 215-256.000.

Pierce, Harless. Vehicle bumper convertible to a tow bar. 3,947,062, Cl. 293-69.00R.

Pierrel, Michel: *See—*
Fort, Pierre Henri Marie; and Pierrel, Michel, 3,946,799.

Pietroni, Piero, to Technofil S.p.A. Diestock for wiredrawing. 3,946,582, Cl. 72-45.000.

Pignocco, Arthur J.: *See—*
Kachik, Robert H.; and Pignocco, Arthur J., 3,946,793.
Kachik, Robert H.; and Pignocco, Arthur J., 3,947,254.

Pikul, Richard E., to Puriton-Bennett Corporation. Pulmonary diagnostic instrument including breath transducer. 3,946,726, Cl. 128-2.080.

Pince, Pierre: *See—*
Sierra, Charles; and Pince, Pierre, 3,946,692.

Pioneer Electronic Corporation: *See—*
Mizukami, Takashi; and Mouri, Takuo, 3,947,645.

Plant, William J.; and Szwarc, John J., to Freeman Chemical Corporation. Light transmissive laminates. 3,947,620, Cl. 428-68.000.

Plantan, Ronald S., to White Motor Corporation. Brake system. 3,947,072, Cl. 303-13.000.

Plate, Gary G., to A.T.R. Equipment Industries Ltd. Bag removing apparatus. 3,947,021, Cl. 271-182.000.

Platt Saco Lowell Corporation: *See—*
Pray, Lester W., 3,946,545.

Platter, Sandford, to Storage Technology Corporation. Transducer head contour and method of generating same. 3,947,887, Cl. 360-103.000.

Plauger, Lillian Rankel, to Bell Telephone Laboratories, Incorporated. Etching of group III-V semiconductors. 3,947,304, Cl. 156-13.000.

Plutchak, Raoul E.: *See—*
Hoft, Donald J.; and Plutchak, Raoul E., 3,947,700.

Pohle, Werner: *See—*
Doehle, Lothar A.; Drescher, Heinz; Lampe, Hans H.; Pohle, Werner; and Rudolph, Peter, 3,947,824.

Poitras, Edward: *See—*
Mackaness, James B.; and Poitras, Edward, 3,946,676.

Polaroid Corporation: *See—*
Murray, Joseph E., Jr., 3,947,187.

Pollack, Vincent A., to Baxter Laboratories, Inc. Method of immunodiffusion. 3,947,250, Cl. 23-230.00B.

Pollet, Robert Joseph; Philippaerts, Herman Adelbert; Sels, Francis Jeanne; and Schelfaut, Francois Leon, to Agfa-Gevaert, N. V. Development modifiers for silver halide emulsions. 3,947,273, Cl. 96-66.300.

Pollheide, Dieter: *See—*
Wingler, Frank; Muller, Richard; and Pollheide, Dieter, 3,947,528.

Pont-A-Mousson S. A.: *See—*
Sutter, Jean Georges; and Depoisson, Jean Pierre, 3,946,986.

Pont-a-Mousson S.A.: *See—*
Fort, Pierre Henri Marie; and Pierrel, Michel, 3,946,799.
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Popov, Boris Evgenievich: *See—*
Golikov, Nikolai Sergeevich; Berlin, Boris Iosifovich; Popov, Boris Evgenievich; Filatov, Andrei Dmitrievich; and Galkin, Dmitry Prokhorovich, 3,947,344.

Popov, Jury Olegovich: *See—*
Alien, Imant Karlovich; Popov, Jury Olegovich; Stolov, Lev

Isaakovich; Yanson, Boris Albertovich; Markov, Igor Alexandrovich; and Nikonenko, Anatoly Vasilievich, 3,947,628.

Porta Systems Corporation: *See—*
De Luca, Paul V.; Carney, William V.; and Fasano, Michael, 3,947,730.

Portera, Vincent John, to Chrysler Corporation. Control circuit for refrigeration compressor motor. 3,946,574, Cl. 62-158.000.

Postma, Willem Johannes; Tielrooy, Hans; and Tobben, Johannes Hubertus, to U.S. Philips Corporation. Coil shape comprising an H-shaped coil core. 3,947,796, Cl. 336-192.000.

Pottier, Michel: *See—*
Senes, Michel; Lhonore, Pierre; Pottier, Michel; and Quibel, Jacques, 3,947,554.

Powell, Michael W., to Motorola Inc. Charge coupled device with electrically settable shift direction. 3,947,863, Cl. 357-24.000.

Powell, Noble R.: *See—*
Irwin, John M.; and Powell, Noble R., 3,947,670.

Powers, J. Bruce, to Dow Chemical Company, The. Clarification of aqueous waste streams containing dispersed dyes. 3,947,248, Cl. 8-81.000.

Powers, Robert Pope; and Gardner, James Dennis, to Firestone Tire & Rubber Company, The. Simplified bead construction for pneumatic tires. 3,946,785, Cl. 152-354.000.

Powers, Robert W.: *See—*
Breiter, Manfred Wolfgang; Mitoff, Stephan P.; and Powers, Robert W., 3,946,751.

PPG Industries, Inc.: *See—*
Bitterice, Michael G., 3,947,837.
Jerabek, Robert D.; and Marchetti, Joseph R., 3,947,338.
Jerabek, Robert D.; Marchetti, Joseph R.; and Zwack, Robert R., 3,947,339.

Prasse, Herbert F.; and McCormick, Harold E., to TRW Inc. Boron-hardened tungsten facing alloy. 3,947,269, Cl. 75-170.000.

Pray, Lester W., to Platt Saco Lowell Corporation. Spindle mounting means for textile twisting machine. 3,946,545, Cl. 57-1.00R.

Preformed Line Products Co.: *See—*
Williams, Harrison L., 3,947,623.

Prenzel, Karl: *See—*
Siebers, Gunter; Prenzel, Karl; and Barthel, Hans, 3,946,842.

Presentey, Shelley M. Arrangement for preventing ambiguity in digital displacement measuring apparatus. 3,947,843, Cl. 340-347.00P.

Presley, Rex Wallace; and Lorraine, Jack Richardson, to Bendix Corporation, The. Magnetic speed sensor. 3,947,711, Cl. 310-155.000.

Priddy, Duane B., to Dow Chemical Company, The. Heterocyclic peroxides. 3,947,418, Cl. 260-246.00B.

Prillinger, Peter F. M.; and Rosenberger, Paul C., to Caterpillar Tractor Co. Strain-limiting fastening apparatus. 3,946,898, Cl. 220-325.000.

Prillinger, Peter F. M.: *See—*
Berg, Lawrance F.; and Prillinger, Peter F. M., 3,947,077.

Primak, Grigory Karpovich: *See—*
Epaneshnikova, Valentina Evgenievna; Kondratskaya, Evgenia Alexandrovna; Primak, Grigory Karpovich; Umantsev, Viktor Sergeevich; and Okun, Svetlana Alexandrovna, 3,947,799.

Prince, Richard B., to Hughes Tool Company. Differentially carburized rock bit cutter. 3,946,817, Cl. 175-374.000.

Prior, Duane Rae: *See—*
Peckinpaugh, Frank Lee; Prior, Duane Rae; and Benton, Kenneth Roberts, 3,946,664.

Prochaska, Helmut: *See—*
Eibl, Johannes; Wolf, Karlheinz; and Prochaska, Helmut, 3,947,246.

Procter, Samuel Anderson, to Control Data Corporation. Metrological TV microscope. 3,947,130, Cl. 356-167.000.

Produits Chimiques Ugine Kuhlmann: *See—*
Pechmeze, Jacques Pierre Edmond; Sureau, Robert Frederic Michel; and Brouard, Claude Marie Henri Emile, 3,947,435.

Progressive Engineering Design: *See—*
Birge, Jackson P., II; and Bradshaw, David A., 3,946,678.

Prokai, Bela; and Kanner, Bernard, to Union Carbide Corporation. Polyurethane foams stabilized with hydrolyzable polysiloxane copolymers. 3,947,386, Cl. 260-2.5AH.

Protek A.G.: *See—*
Bettex, Marcel, 3,946,728.

Protocol Engineering Limited: *See—*
Mayston, Donald, 3,946,588.

Proulx, Sylvester Eugene; and Beneteau, Stanley Alexander, to J. P. Tool Limited. Broaching tool. 3,946,472, Cl. 29-95.100.

Pryor, Michael J.; and Gray, Thomas J., to Swiss Aluminium Limited. Ceramic foam filter. 3,947,363, Cl. 210-510.000.

Przybylek, George J., to Burroughs Corporation. Mercury capsule assembly for display panel. 3,947,713, Cl. 313-174.000.

Pugh, Mary A. Combined weiner cooker and popcorn popper. 3,946,653, Cl. 99-340.000.

Pugh, Stuart: *See—*
Douthwaite, Clifford; Pugh, Stuart; and Semeneko, Ivan, 3,946,668.

Pugh, William A. Container lid with tear-out closure and straw. 3,946,895, Cl. 220-269.000.

Puhak, Peter George, to GTE Sylvania Incorporated. Fast warm up cathode for a cathode ray tube. 3,947,715, Cl. 313-270.000.

Pulse Dynamics Manufacturing Corporation: *See—*
Zimmer, Russell D.; and Traver, William S., 3,947,060.

Purdue Frederick Company, The: *See—*
Kelly, William, deceased; Kelly, Monica, representative; Kelly, John, representative; and Halpern, Alfred, 3,947,491.

Purex Corporation: *See—*
Tahbaz, John A., 3,946,597.

Puriton-Bennett Corporation: *See—*
Pikul, Richard E., 3,946,726.

Puttock, Michael A.: *See—*
Graham, Bruce A.; Puttock, Michael A.; Felauer, Ethel E.; and Neidermyer, Robert W., 3,947,264.

Putzmeister Interholding GmbH.: *See—*
Schlecht, Karl, 3,947,194.

Pylon Electronic Development Company Ltd.: *See—*
Smith, Arthur, 3,947,747.

Quame, Babington A. Laboratory container. 3,947,251, Cl. 23-259.000.

Quant, Donald J.: *See—*
Thettu, Raghulinga R.; and Quant, Donald J., 3,947,108.

Queener, Carl A.: *See—*
Munzel, Howard E.; and Queener, Carl A., 3,947,271.

Quepor S.A.: *See—*
Egger, Hermann, 3,947,249.

Quibel, Jacques: *See—*
Senes, Michel; Lhonore, Pierre; Pottier, Michel; and Quibel, Jacques, 3,947,554.

R. Funk & Co., Inc.: *See—*
Funk, Rudolph; and Funk, Roger S., 3,947,015.

Raasch, Maynard S., to Du Pont de Nemours, E. I., and Company. 1-Hydrocarbyl-3-mono- and -dithiocarbamoylureas. 3,947,511, Cl. 260-545.00R.

Rabedeau, Melbourne Edward, to International Business Machines Corporation. Omnidirectional optical scanning apparatus. 3,947,816, Cl. 340-146.30Z.

Radford, Michael Harold, to Barry Wright Corporation. Means for resiliently supporting a body. 3,946,976, Cl. 248-18.000.

Raether, Wolfgang: *See—*
Durckheimer, Walter; Raether, Wolfgang; and Seliger, Hubert Georg, 3,947,449.

Rainville Company, Inc.: *See—*
Rainville, Dewey, 3,947,176.

Rainville, Dewey, to Rainville Company, Inc. Double injection mold with neck gating. 3,947,176, Cl. 425-130.000.

Rakestraw, Lawrence F., to Monsanto Company. Method for producing fine diameter wire from steel-titanium melts. 3,946,794, Cl. 164-82.000.

Rakhimov, Vladimir Vildanovich: *See—*
Zhuchkov, Ivan Ilich; Filonov, Viktor Sergeevich; Zaitsev, Boris Ivanovich; Artemiev, Lev Nikolaevich; and Rakhimov, Vladimir Vildanovich, 3,947,318.

Ralph, John Ernest: *See—*
Shannon, John Martin; Ralph, John Ernest; and Schagen, Pieter, 3,947,707.

Ralph M. Parsons Company, The: *See—*
Barry, Charles B., 3,946,810.

Rance, David G.: *See—*
Bell, George; Rance, David G.; and Raxworthy, Sydney, 3,946,930.

Randall, David I., to GAF Corporation. 4-Halo-1-hydroxyanthraquinone containing fungicidal composition. 3,947,594, Cl. 424-331.000.

Randmer, Jacob A., to Machlett Laboratories, Inc., The. Circuit interrupting means. 3,947,797, Cl. 337-31.000.

Rankin, Billy F., to Burton, Parsons and Company, Inc. Opthalmic solution. 3,947,573, Cl. 424-80.000.

Rapp, James E., to Owens-Illinois, Inc. Lead-bismuth glasses for acoustooptic and magnetooptic devices. 3,947,089, Cl. 350-151.000.

Ratcliffe, Ronald W.: *See—*
Christensen, Burton G.; and Ratcliffe, Ronald W., 3,947,413.

Raugh, Donald D.; and Jones, Larry C., to National Steel Corporation. Torsion resistant girder. 3,946,533, Cl. 52-729.000.

Ravn, Ole Stig, to Stig Ravn A/S. Arrangement for securing a nozzle to a container. 3,946,914, Cl. 222-574.000.

Raxworthy, Sydney: *See—*
Bell, George; Rance, David G.; and Raxworthy, Sydney, 3,946,930.

Raychem Corporation: *See—*
Smith-Johannsen, Robert; and Moyer, Wendell William, Jr., 3,947,257.

Raygo, Inc.: *See—*
Takata, Harry H.; and Bauer, Norman A., 3,947,142.

Raymond Lee Organization, Inc., The: *See—*
Battilana, Remeo A.; and Battilana, Ann C., 3,947,676.
Butler, Robert C., 3,946,839.
Evans, William D., 3,946,978.
Knight, Hoye, 3,946,443.
Sudol, Daniel H., 3,946,779.
Waters, John L., 3,947,034.

Raytheon Company: *See—*
Stallard, David V., 3,946,968.
Tiefert, Karl H., 3,947,298.

RCA Corporation: *See—*
Bube, Kenneth Roger, 3,947,801.
Busanovich, Charles John; Fischer, John Theodore; Moore, Robert Milton; and van Raalte, John A., 3,947,717.
Christensen, Don Edward, 3,947,773.
Giger, Robert John; and Lawrence, James Michael, 3,947,632.
Lyon, John Jeffrey, 3,947,845.
Stewart, Roger Green, 3,947,727.
Thompson, Ira Foy, 3,947,793.

Recherche et Industrie Therapeutiques (R.I.T.): *See—*
Ghosez, Leon; Cossement, Eric; and Biname, Robert, 3,947,469.
Recognition Equipment Incorporated: *See—*
Requa, Stanley C., deceased; and Recognition Equipment, Inc., 3,947,817.
Requa, Stanley C., deceased; and Recognition Equipment, Inc., 3,947,817.
Redman, Charles M., to United States of America, Army. Electron image recorder with semiconductive image intensifier. 3,947,852, Cl. 346-74.0EB.
Redmon, James E., to Agricultural Enterprises, Inc. Variable voltage inverter. 3,947,745, Cl. 321-2.000.
Reeves, Wilson A.: *See—*
Andrews, Bethlehem K.; Frick, John G., Jr.; and Reeves, Wilson A., 3,947,613.
Rehder, Ludwig; Kaiser, Renate; and Lorenz, Roland. Metal iodide vapour discharge lamp. 3,947,714, Cl. 313-225.000.
Rehling, Charles J.: *See—*
Caveney, Jack E.; Moody, Roy A.; Fulton, Ronald T.; and Rehling, Charles J., 3,946,769.
Reimann, Walter H.; and Brisbane, Alton W., to United States of America, Air Force. Treatment of aluminum alloys. 3,947,297, Cl. 148-159.000.
Reinhard, Clyde J., to Birtcher Corporation, The. Input bias and signal conditioning circuit with overload indication for differential amplifiers. 3,947,779, Cl. 330-10.000.
Reis, John P., to Amity Leather Products Co. Credit card billfold and a flexible card protecting flap. 3,946,781, Cl. 150-35.000.
Reissig, Frank: *See—*
Hahn, Erich; and Reissig, Frank, 3,947,112.
Reliance Electric Company: *See—*
Oliver, Theodore A., 3,947,738.
Repenkova, Tatyana Grigorievna: *See—*
Baklanov, Nikolai Mikhailovich; Buslakova, Ljubov Pavlovna; Nekorystnova, Raisa Mikhailovna; Novikov, Anatoly Artemievich; Repenkova, Tatyana Grigorievna; Rumyantsev, Ivan Ivanovich; Sapogova, Galina Alexandrovna; Solodovnik, Nikolai Pavlovich; and Fridman, Viktor Mironovich, 3,947,262.
Requa, Stanley C., deceased; and by Recognition Equipment, Inc., to Recognition Equipment Incorporated. Hand operated optical character recognition wand. 3,947,817, Cl. 340-146.3MA.
Research Corporation: *See—*
Muxfeldt, Hans H.; and Michael, Jeffrey, 3,947,517.
Rettig, Terry W.; and Felsen, Marvin J., to Lockheed Aircraft Corporation. Acoustic emission method for detection and monitoring of corrosion. 3,946,600, Cl. 73-71.400.
Reuting, Hans-Werner, to Elmeg Elektro-Mechanik GmbH. Electromagnetic relay. 3,947,792, Cl. 335-201.000.
Reutter, John W. Tool for refacing valve seats on faucets or the like. 3,946,526, Cl. 51-241.0VS.
Rexham Corporation: *See—*
Lichtwardt, Harlow E.; Schrier, Bruce; Crutchley, Frank; and White, Thomas, 3,947,313.
Rhee, Dong Woo; and Thomas, Joseph Edward, to GTE Sylvania Incorporated. Automatic video signal control circuit. 3,947,631, Cl. 178-7.30R.
Rheiner, Alfred, to Hoffman-La Roche Inc. Substituted 4-phenyl isoquinolines. 3,947,456, Cl. 260-289.00R.
Rhone-Poulenc, S.A.: *See—*
Balme, Maurice; and Gruffaz, Max, 3,947,493.
Brunie, Jean Claude; Costantini, Michel; Crenne, Noel; and Joufret, Michel, 3,947,490.
Rhone-Progil: *See—*
Biola, Georges; and Schneider, Gerard, 3,947,476.
Correia, Yves; and Lanet, Jean-Claude, 3,947,508.
Rice, Robert R.; and Burkhart, Gordon H., to McDonnell Douglas Corporation. Acoustooptic mode-locker frequency doubler. 3,947,780, Cl. 331-94.50M.
Richard Heinze GmbH & Co. KG, Firma: *See—*
Ehlebracht, Horst; and Philipp, Albert, 3,946,979.
Richardson-Merrell Inc.: *See—*
Shemano, Irving, 3,947,593.
Richmond, John Russell: *See—*
Campbell, John Stewart; Davies, Phineas; and Richmond, John Russell, 3,947,381.
Richter, Bela: *See—*
Haas, Werner E. L.; Adams, James E.; and Richter, Bela, 3,947,183.
Richter, Enrique Kusminsky. Gas burner. 3,947,229, Cl. 431-125.000.
Rickel Manufacturing Corporation: *See—*
Jester, Oden; and Bergkamp, Melvin A., 3,946,824.
Ricoh Co., Ltd.: *See—*
Imai, Tadayuki; and Shiratori, Toshitaka, 3,947,860.
Kobayashi, Yugoro, 3,947,020.
Yokoyama, Shizuo, 3,946,666.
Riedhammer, Josef, to Hydromatik GmbH. Fluid pressure control devices. 3,946,561, Cl. 60-445.000.
Riegel, Herbert: *See—*
Brooks, Maurice E.; Riegel, Herbert; Schindler, Harvey D.; and Sze, Morgan C., 3,947,489.
Riehlmann, Joseph F. Collapsible ladder suitable for use as fire escape. 3,946,833, Cl. 182-20.000.
Rigal, Jean; and Troton, Jacques, to Creusot-Loire. Double wall vessel. 3,946,892, Cl. 220-9.00B.
Riggs, Thomas C.: *See—*
Black, Arthur L.; and Riggs, Thomas C., 3,947,160.
Rikagaku Kenkyusho: *See—*
Misato, Tomomasa; Huang, Keng Tang; Homma, Yasuo; Kanao, Seizo; Toyoda, Takeshi; Suyama, Tadashi; and Shida, Toshiro, 3,947,589.
Riken Piston Ring Kogyo Kabushiki Kaisha: *See—*
Maruyama, Masayuki; and Watanabe, Joichi, 3,947,046.
Riley, Edward Donald: *See—*
Weinstein, Barry; and Riley, Edward Donald, 3,946,552.
Riley, William T.: *See—*
Odioso, Raymond C.; Riley, William T.; and Jones, David A., 3,946,945.
Ringleben, Hans: *See—*
Jarchow, Friedrich G. K.; Haensel, Dietrich; Hempelmann, Willi; Sturmath, Rainer; Ringleben, Hans; and Knabel, Walter, 3,947,311.
Riseley, Eric Ivan: *See—*
Marshall, Geoffrey; and Riseley, Eric Ivan, 3,947,538.
Ritsko, Joseph E.; and Parsons, Donald S., to GTE Sylvania Incorporated. Process for producing cobalt coated refractory metal carbides. 3,947,616, Cl. 427-430.000.
Ritter, Edmond Jean: *See—*
Kelly, Ralph; and Ritter, Edmond Jean, 3,947,382.
Rivetti, Enrico; and Rosso, Giuseppe, to Fiat societa per Azioni. Master cylinders for dual hydraulic braking systems. 3,946,563, Cl. 60-535.000.
Rizzo, Victor L.; and Friedman, Alan R., to Upjohn Company, The. Pesticidal N,N''-thio and dithio bis(substituted phenyl formamidines). 3,947,591, Cl. 424-326.000.
Robbins, Albert H.; and Wilson, Freddie W. Air dynamo pressure regulation and modulation device for surface effect ships and air cushion vehicles. 3,946,689, Cl. 114-67.00A.
Robert Boach GmbH: *See—*
Laufer, Helmut, 3,946,713.
Robert Bosch GmbH: *See—*
Bechstein, Herbert; Biebl, Herbert; Eckell, Wolfgang; Franz, Anton; Hofmann, Eberhard; Stauch, Hans; Staudt, Heinrich; Tomasch, Hellmut; Urlberger, Alois; and Winnewisser, Theodor, 3,946,590.
Eckert, Konrad; and Stumpp, Gerhard, 3,946,714.
Konrath, Karl, 3,946,716.
Staudt, Heinrich, 3,946,715.
Roberts, Richard; Vranos, Alexander; Schlein, Barry C.; and Rummel, David H., to United Technologies Corporation. Two-stage premixed combustor. 3,946,553, Cl. 60-39.74R.
Robertson, Arthur B.; and Schaffhauser, Robert J., to Allied Chemical Corporation. Melt-processable, radiation cross-linkable E-CTFE copolymer compositions. 3,947,525, Cl. 204-159.170.
Robertson, Daniel Stewart: *See—*
Born, Peter Jeremy; and Robertson, Daniel Stewart, 3,947,549.
Robin M. Towne and Associates, Inc.: *See—*
Towne, Robin M.; and Champ, Stanley G., 3,946,598.
Robinson, Harold R., to Hawkins, David B., a part interest. Towing device for small planes and the like. 3,946,886, Cl. 214-334.000.
Robinson, Paul E., to S.A. Brush Company Limited. Mop wringer. 3,946,457, Cl. 15-119.00R.
Rochfort, William P. K. Vibrating paddle assembly for a slip former. 3,947,167, Cl. 425-64.000.
Rock Industries Machinery Corporation: *See—*
Bond, Richard S., 3,946,955.
Rocktaschel, Gottfried; Thurn, Friedrich; Fleischhauer, Horst; Schwarze, Werner; and Westlinning, Hermann, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Sulfur containing organo-organooxysilane. 3,947,436, Cl. 260-249.500.
Rockwell International Corporation: *See—*
Catterfeld, Fritz C., 3,946,556.
George, Peter K., 3,947,830.
Jones, Freeman B., Jr.; and Govan, Ronald M., 3,946,616.
Nicholas, David C.; Torgrim, Willard J.; and Kleitsch, John C., 3,947,639.
Trcka, James S., 3,947,091.
Rodgers, Aubrey; Bailey, Escar L.; and Widner, Rayburn K., to United States of America, Army. Stabilized transportation machine. 3,946,967, Cl. 244-3.200.
Rodgers, William G., Jr.: *See—*
Taylor, Walter F.; Rodgers, William G., Jr.; and Chappell, John R., 3,946,687.
Roehrig, Adalbert; Zeller, Josef; and Stilli, Adrian, to Concast AG. Pendulum shear for continuous casting installation. 3,946,630, Cl. 83-311.000.
Rogers, Charles H.: *See—*
Cotter, Douglas A.; and Rogers, Charles H., 3,947,121.
Rohr, Franz; Holtschmit, Heinz; and Siewerth, Gerhard, to BBC Brown Boveri & Company Limited. Process for producing chemical compounds applicable to surfaces in the form of thin layers. 3,947,606, Cl. 427-50.000.
Rohr Industries, Inc.: *See—*
Houser, Raymond E., 3,946,837.
Roli Chemical, Ltd.: *See—*
Heidenberger, Guenter J., 3,947,330.
Roll, Ronald G.: *See—*
Fehlner, Leo F.; Jerardi, Thomas W.; and Roll, Ronald G., 3,947,849.
Rolla, Clarence P.: *See—*
Holland, Charles L.; and Rolla, Clarence P., 3,946,470.
Ronkholz-Tolle, Roswitha, nee Tolle. Slatted curtain. 3,946,789, Cl. 160-166.00A.

Rooks, Wendell H., II, to Syntex (U.S.A.) Inc. Reduction of serum lipid levels, and agents and compositions useful therefor. 3,947,479, Cl. 260-397.400.

Rose, Peter, to Heidenreich & Harbeck, Zweigneiderlassung der Gildemeister AG. Apparatus for manufacturing plastics blanks. 3,947,203, Cl. 425-245.00R.

Rosenberger, Hugo. Paving block. 3,947,192, Cl. 404-41.000.

Rosenberger, Paul C.: *See—*
Prillinger, Peter F. M.; and Rosenberger, Paul C., 3,946,898.

Rosgen, Karl; and Noack, Klaus, to Bergwerksverband GmbH. System for protecting persons underground from dangerous areas. 3,947,832, Cl. 340-224.000.

Ross Corporation: *See—*
Ross, Thorvald S., Jr.; and Entin, Leonard P., 3,946,662.

Ross, Joseph; and Fuchs, Ernest Frederick, to Ace Envelope Manufacturing Corporation. Printing press centrifugal pump assembly. 3,947,152, Cl. 417-360.000.

Ross, Louis, to Borg-Warner Corporation. Hydraulic system cavitation suppressor. 3,946,562, Cl. 60-464.000.

Ross, Stephen T.: *See—*
Brenner, L. Martin; Petta, John M.; and Ross, Stephen T., 3,947,470.

Ross, Thorvald S., Jr.; and Entin, Leonard P., to Ross Corporation. Material receiving and compaction system and apparatus therefor. 3,946,662, Cl. 100-240.000.

Rossi, Eugene F., to Allis-Chalmers Corporation. Nozzle for rotary kiln. 3,946,949, Cl. 239-600.000.

Rossi, Pietro Paolo: *See—*
Siclari, Francesco; and Rossi, Pietro Paolo, 3,947,276.

Rosso, Giuseppe: *See—*
Rivetti, Enrico; and Rosso, Giuseppe, 3,946,563.

Rothmayr, Willy: *See—*
Kleemann, Thomas; and Rothmayr, Willy, 3,947,166.

Rousos, William Nicholas; and Denny, Robert Bruce, to Hoffman Electronics Corporation. Threshold correction system in FSK transmissions. 3,947,769, Cl. 325-320.000.

Rousseau, Patrick M., to General Foods Corporation. Dipeptide sweetening of comestibles. 3,947,600, Cl. 426-302.000.

Roussel Uclaf: *See—*
Derible, Pierre Henri; and Lavaux, Jean-Paul, 3,947,578.

Rouverol, William S. Internal gearing. 3,946,621, Cl. 74-462.000.

Royer, Galen B.: *See—*
Hiedecker, Robert F.; Johnson, A. Kenneth; and Royer, Galen B., 3,947,886.

Rubino, Andrew M.: *See—*
Jones, John L.; Rubino, Andrew M.; and Lindahl, Charles B., 3,947,556.
Jones, John L.; Rubino, Andrew M.; and Lindahl, Charles B., 3,947,557.

Rudolph, Peter: *See—*
Doehle, Lothar A.; Drescher, Heinz; Lampe, Hans H.; Pohle, Werner; and Rudolph, Peter, 3,947,824.

Ruell, Hartwig; Pekau, Dietlind; and Eschler, Hans, to Siemens Aktiengesellschaft. Method and device for recording data as holograms in a multi-channel storage tape. 3,947,640, Cl. 179-100.30B.

Ruffer, Adam: *See—*
Miedtank, Sighart; Ruffer, Adam; and Galster, Hans, 3,947,515.

Ruffini, Egidio J.: *See—*
Michel, Frank; and Ruffini, Egidio J., 3,947,145.

Ruge, Donald H.: *See—*
Hartman, William H.; Mietz, Raymond E.; Peschke, John R.; and Ruge, Donald H., 3,947,255.

Ruget, Gabriel, to Creusot-Loire. Machine for testing bearing grease. 3,946,593, Cl. 73-10.000.

Rummel, David H.: *See—*
Roberts, Richard; Vranos, Alexander; Schlein, Barry C.; and Rummel, David H., 3,946,553.

Rumyantsev, Ivan Ivanovich: *See—*
Baklanov, Nikolai Mikhailovich; Buslakova, Ljubov Pavlovna; Nekorystnova, Raisa Mikhailovna; Novikov, Anatoly Artemievich; Repenkova, Tatyana Grigorievna; Rumyantsev, Ivan Ivanovich; Sapogova, Galina Alexandrovna; Solodovnik, Nikolai Pavlovich; and Fridman, Viktor Mironovich, 3,947,262.

Rundell, Herbert A.: *See—*
Cox, Percy T.; and Rundell, Herbert A., 3,947,664.

Russell, Dennis, Jr., to Particle Data, Inc. Digitally controlled variable impedance for current normalization in an electrolyte type particle sensing zone. 3,947,701, Cl. 307-264.000.

Russell, Lewis K., to Signetics Corporation. Collector-up semiconductor circuit structure for binary logic. 3,947,865, Cl. 357-46.000.

Rust, Albert Edward: *See—*
Jeffrey, Charles Jerrold; Rust, Albert Edward; and Winslow, William Albert, 3,946,859.

Rutter, Peter William, to Ilford Limited. Package containing a stack of flexible sheet material. 3,946,868, Cl. 206-455.000.

Ryss, Jury Samuilovich; Bakhtin, Jury Grigorievich; Chamaev, Viktor Nikolaevich; and Panteleimonov, Vladimir Mikhailovich. Device for geophysical prospecting of ore deposits. 3,947,756, Cl. 324-1.000.

S.E.F.I. Sondages-Etanchements-Forages-Injections: *See—*
Freydier, Pierre Henry, 3,946,570.

S-P Products, Inc.: *See—*
Bailey, Russell O.; and Stone, William S., 3,946,491.

Sabo, Stephen C.: *See—*
Babbin, William R.; and Sabo, Stephen C., 3,946,918.

Sadler, Harry J.; Pareja, Ramon; and Leschisin, John, to Lear Siegler, Inc. Single cylinder pump. 3,947,157, Cl. 417-559.000.

Sadler, John W.; and Sadler, Theodore J. Football board game apparatus. 3,947,039, Cl. 273-134.0CF.

Sadler, Theodore J.: *See—*
Sadler, John W.; and Sadler, Theodore J., 3,947,039.

Saeva, Franklin D.; and Sharpe, Patrick E., to Xerox Corporation. Imaging method. 3,947,184, Cl. 350-160.0LC.

Sagawa, Seiji; Nakagawa, Tsunehiko; Yoshida, Osamu; Mori, Kenjiro; and Ebisutani, Junichi, to Sumitomo Chemical Company, Limited. Method for inhibiting premature vulcanization of diene rubbers. 3,947,429, Cl. 260-79.50B.

Sagi, Zsigmond; and Weinstein, Berel, to Bio-Medical Sciences, Inc. Temperature indicating compositions. 3,946,612, Cl. 73-356.000.

Sailor Pen Co., Ltd., The: *See—*
Hori, Jiro, 3,947,137.

St. Jacques, Gerald A.: *See—*
Hansen, Raymond J.; St. Jacques, Gerald A.; and Whitely, Robert M., 3,947,854.

St. Joe Minerals Corporation: *See—*
Zunkel, Alan Douglas, 3,947,561.

Saita, Toshikazu, to Mitsubishi Denki Kabushiki Kaisha. Device for adjusting ignition time for internal combustion engine. 3,946,708, Cl. 123-117.00R.

Saito, Chiaki: *See—*
Horiie, Shigeki; Kurematsu, Susumu; Asai, Shinichiro; and Saito, Chiaki, 3,947,536.

Saito, Makoto: Matsumoto, Kengo; and Hayakawa, Kiyonori, to Sony Corporation. Static magnetic erasing head. 3,947,891, Cl. 360-118.000.

Saito, Shoichi, to Olympus Optical Company Ltd. Resilient microphone mounting. 3,947,646, Cl. 179-146.00R.

Saito, Teruo; Seki, Hideki; and Hiroyasu, Mamoru, to Matsushita Electric Industrial Company, Ltd. Helical scan type tape cassette having tape threading means. 3,947,892, Cl. 360-132.000.

Saito, Yutaka. Cash register computing system. 3,947,660, Cl. 235-61.60R.

Sakai, Yoshijiro. Clamping device for a protective device mounted on a safety headgear. 3,946,466, Cl. 24-243.00B.

Sakamoto, Keisuke: *See—*
Asamura, Takashi; Sawai, Shigeki; Sakamoto, Keisuke; Ikeda, Hajime; and Toshimitsu, Tohoru, 3,947,294.

Sale, Ernest W.; Edwards, Thomas A.; and Hodges, John W., to Agrico Chemical Company. Production of ammonium polyphosphate solutions. 3,947,261, Cl. 71-34.000.

Salisbury, Charles W., to Owens-Illinois, Inc. Method of sealing and spacing glass substrates of gaseous discharge display panels used at high altitudes. 3,947,260, Cl. 65-42.000.

Salmoiraghi, Angelo. Device for manipulating textile cops. 3,946,547, Cl. 57-52.000.

Samuels, Harold, to Adult Leisure Products Corporation. Instructional indicia carrying member for chess piece. 3,947,040, Cl. 273-137.00R.

Sandco Limited: *See—*
Fast, Sven Gunnar, 3,947,360.

Sandefur, Douglas M. Conveyor assembly. 3,946,861, Cl. 198-208.000.

Sandoz, Inc.: *See—*
Houlihan, William J., 3,947,460.

Saner, Kaspar, to Wirth Gallo & Company. Balance. 3,946,821, Cl. 177-227.000.

Sannella, Joseph L.: *See—*
Cerny, Daryl D.; Cannon, Robert W.; Okeley, Robert E., II; and Sannella, Joseph L., 3,946,670.

Santo, Eugenio Espiritu, to Sundstrand Corporation. Burner control with interrupted ignition. 3,947,219, Cl. 431-79.000.

Santos, Osvaldo: *See—*
Picoy, Anthony R.; and Santos, Osvaldo, 3,946,891.

Sanvito, Francis A.; and Pearson, Allen L., to Emerson Electric Co. Fin and spin stabilized rocket. 3,946,639, Cl. 89-1.808.

Sapogova, Galina Alexandrovna: *See—*
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Sarna, Edward J.; Ishler, Norman H.; and Jellema, Joseph, to Phoenix Research Inc. Effervescent medicaments. 3,947,566, Cl. 424-45.000.

Sartorius, Guy, to Societe des Aciers Fins de l'Est. Temperature measuring device for metallurgical furnaces. 3,946,610, Cl. 73-343.00R.

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Sato, Shoji, to Alps Electric Co., Ltd. AFC tuning circuit. 3,947,772, Cl. 325-422.000.

Sato, Shunichi; Tanigaichi, Mineaki; and Iwasawa, Kazuyoshi, to Mitsubishi Gas Chemical Company, Inc. Resin composition for laminates and prepared therefrom. 3,947,393, Cl. 260-19.00N.

Satterwhite, Fred B., to K. M. G. Machinery Limited. Method of producing textured yarn. 3,946,468, Cl. 28-72.110.

Saucy, Gabriel: *See—*
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Schabernack, Paul; and von Jan, Wolfgang, to Kabel-und Metallwerke Gutehoffnungshutte AG. Making of a wave guide. 3,947,348, Cl. 204-9.000.

Schafer, Horst, to Semikron, Gesellschaft fur Gleichrichterbau und Elektronik m.b.H. Method for producing a surface stabilizing protective layer in semiconductor devices. 3,947,303, Cl. 156-3.000.

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Schaffling, Otto G., to Olin Corporation. Composition comprising epoxy resin, copolymer of butadiene and acrylic acid, curing agent and inorganic metal salt. 3,947,523, Cl. 260-837.00R.

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Schiel, Christian, to J. M. Voith, GmbH. Heated dryer drum for paper machines and the like. 3,946,499, Cl. 34-124.000.

Schiesterl, Gerhard; and Wulf, Helmut, to Daimler-Benz AG. Monitoring system for a steering wheel mounted air bag gas source. 3,947,057, Cl. 280-150.0AB.

Schifman, Edward J., to Aladdin Industries, Inc. Window mounted planter box. 3,946,522, Cl. 47-36.000.

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Schmitt, Robert A., to Columbia Machine, Inc. Apparatus for disassembling a layered stack of articles. 3,946,880, Cl. 214-8.50R.

Schmitter, Andre; Kiefer, Jurg; and Haug, Theobald, to Ciba-Geigy Corporation. Mixtures containing prepolymers, which can be converted to heat-resistant foamed plastics. 3,947,385, Cl. 260-2.50N.

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Scholler, Jean-Pierre, to Compagnie Internationale Pour L'Informatique. Regulated supply units. 3,947,703, Cl. 307-297.000.

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Schulde, Felix; Obendorf, Johann; Neubold, Kurt; and Dormann, Gunter, to Veba-Chemie Aktiengesellschaft. Method for making matt finish coatings. 3,947,384, Cl. 260-2.00N.

Schultz, Ward Edward; Smith, Harry Davis, Jr.; and McKinlay, Philip France, to Texaco Inc. Combination of epithermal and inelastic neutron scattering methods to locate coal and oil shale zones. 3,947,683, Cl. 250-270.000.

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Schuster, Robert, to Linde Aktiengesellschaft. Removal of heat of compression. 3,947,146, Cl. 415-1.000.

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Schwanz, Wilfried, to Volkswagenwerk AG. Impact-element for the protection of the occupant of a vehicle. 3,947,056, Cl. 280-150.00B.

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Singer Company - Patent Department, The: *See—*
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Singh, Harkrishan, to Ford Motor Company. Vehicle sensitive inertia retractor. 3,946,965, Cl. 242-107.40R.

Siorek, Richard W.: *See—*
Magnuson, Roland A.; and Siorek, Richard W., 3,946,705.

Sioufy, Tamim El, to MEKOPHARMA Dr. Becker & Cie. K.G. Apparatus for disinfection and chemical purification of toilet bowls. 3,946,448, Cl. 4-223.000.

Sirand-Rey, Gerard Rene: *See—*
Travot, Guy Claude Daniel; and Sirand-Rey, Gerard Rene, 3,947,890.

Sirius Corporation: *See—*
Fairbairn, Thomas E., 3,947,653.
Fairbairn, Thomas E., 3,947,654.

Sittmann, Brigitte, to Vereinigte Baubeschlagfabriken Gretsch and Co. GmbH. Safety ski binding with transmitter arranged between the leg and the shoe of the skier. 3,947,051, Cl. 280-11.35R.

Sittmann, Brigitte, to Vereinigte Baubeschlagfabriken Gretsch & Co. Retaining mechanism for safety ski bindings. 3,947,053, Cl. 280-11.35K.

Skagerlund, Lars-Erik: *See—*
Pettersson, Henry Gustaf Erland; Skagerlund, Lars-Erik; and Stalfors, Rolf Lennart, 3,946,674.

SKF Industrial Trading and Development Company B.V.: *See—*
Johansson, Carl Eric, 3,946,576.

Skold, Jan O.; and Kapoor, Virendra Nath, to Buffalo Forge Company; and Aktiebolaget Carl Munters, part interest to each. Liquid distribution strip. 3,947,532, Cl. 261-112.000.

Skoting, Lars-Goran, to AB Casco. Device for handling sheet material. 3,947,064, Cl. 294-67.00E.

Slater, Gerald E., to Newtoys, Inc. Tiretoys. 3,947,024, Cl. 272-60.00R.

Smit Nijmegan B.V.: *See—*
Graat, Johannes W.; Pelser, Johannes C. H.; and Hoornenborg, Bart C., 3,947,217.

Smith, Albert Ernest, to Technical Operations, Incorporated. Production of colored designs. 3,947,105, Cl. 353-121.000.

Smith, Arthur, to Pylon Electronic Development Company Ltd. Regulated transistorized DC to DC converter and parallel operation of plurality of converters. 3,947,747, Cl. 321-2.000.

Smith, Carl H.; and Sidler, August X., to Auto Research Corporation. Electronic pressure cycle indicator. 3,947,836, Cl. 340-270.000.

Smith, Craig P., deceased: *See—*
Arvanitis, Aristotelis; Malinowski, Stanley; Smith, Craig P., deceased; and Page, Paul N., administrator, 3,947,784.

Smith, David R., to Westinghouse Electric Corporation. Network protector relay. 3,947,728, Cl. 317-47.000.

Smith, Harry A.: *See—*
Freeman, Harlan G.; Gillern, Maurice F.; and Smith, Harry A., 3,947,425.

Smith, Harry Davis, Jr.: *See—*
Schultz, Ward Edward; Smith, Harry Davis, Jr.; and McKinlay, Philip France, 3,947,683.

Smith, Ivan L., to Texaco Inc. Pilot light system for lighting a main burner for heating high velocity high pressure turbulent air. 3,947,231, Cl. 431-285.000.

Smith-Johannsen, Robert; and Moyer, Wendell William, Jr., to Raychem Corporation. Benzotrifluoride fuel additive for internal combustion engines. 3,947,257, Cl. 44-79.000.

Smith, Lawrence S.: *See—*
Linebrink, Kail L.; and Smith, Lawrence S., 3,946,551.

Smith, Malcolm Kenneth, to Wiggins Teape Research & Devel. Ltd. Method of producing non-woven fibrous material. 3,947,315, Cl. 162-101.000.

Smith, Montford H., to United States of America, Energy Research and Development Administration. Control and shim rod arrangement with moveable plugs. 3,947,321, Cl. 176-87.000.

Smith, Richard E., to Xerox Corporation. Partially submerged active crossmixer. 3,947,107, Cl. 355-3.0DD.

Smith, Ronald Morton: *See—*
Padegs, Andris; and Smith, Ronald Morton, 3,947,823.

Smith, Traver J., to Genevieve I. Hanscom (formerly Genevieve I. Magnuson); and Genevieve I. Hanscom, Robert Magnuson, Louis J. Thomson (formerly Lois J. Duggan), as Trustees of Estate of Roy M. Magnuson, part interest to each. Peeling apparatus for fruit and vegetable articles. 3,946,658, Cl. 99-627.000.

Smith, Wayne A.: *See—*
Mathews, James E.; Smith, Wayne A.; and Wilkinson, Lester, 3,947,771.

SmithKline Corporation: *See—*
Brenner, L. Martin; Petta, John M.; and Ross, Stephen T., 3,947,470.
Sutton, Blaine M.; and Weinstock, Joseph, 3,947,565.
Weinstock, Joseph, 3,947,580.

Smolyak, Vsevolod Dmitrievich: *See—*
Tkach, Grigory Anatolievich; Smolyak, Vsevolod Dmitrievich; Frumin, Vitaly Moiseevich; and Klimor, Anatoly Grigorievich, 3,946,804.

Snamprogetti S.p.A.: *See—*
Dinelli, Dino; Bartoli, Francesco; and Gulinelli, Silvio, 3,947,325.
Morelli, Morello; and De Marco, Fortunato, 3,947,510.

Snell, George J.; and Kwon, Joon Taek, to Lummus Company, The. Coal liquefaction. 3,947,346, Cl. 208-10.000.

Snia Viscosa Societa' Nationale Industria Applicazioni Viscosa S.p.A.: *See—*
Siclari, Francesco; and Magnoni, Franco, 3,946,835.

Snia Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A.: *See—*
Siclari, Francesco; and Rossi, Pietro Paolo, 3,947,276.

Snow, Ralph K., Jr.; Grist, Warren W.; and Kruger, Joe Bill, to CMI Corporation. Trimmer type road construction apparatus with pivotally connected conveyor. 3,946,506, Cl. 37-108.00R.

Snyder, Harry R., Jr.: *See—*
Spencer, Claude F.; and Snyder, Harry R., Jr., 3,947,434.

Snyder, James E.: *See—*
Grandine, Joseph D.; Marsh, Nat H.; and Snyder, James E., 3,947,345.

Sobajima, Shigenobu; Tamura, Minoru; Azuma, Yoichi; and Takekata, Kiyoshi, to Teijin Ltd. Electrically insulating powdery material, a process for its preparation and thermally conducting and electrically insulating filled resin composition using said insulating powdery material as filler. 3,947,373, Cl. 252-63.200.

Societe Anonyme Automobiles Citroen: *See—*
Cadiou, Jean, 3,947,680.
Cadiou, Jean Georges, 3,946,827.

S.A. Brush Company Limited: *See—*
Robinson, Paul E., 3,946,457.

Societe Anonyme Cortial S. A.: *See—*
Negrevergne, Georges, 3,947,587.

Societe Anonyme D.B.A.: *See—*
Muterel, Roland, 3,947,648.

Societe Anonyme Usines Emile Henricot: *See—*
Henricot, Paul E., 3,946,677.

Societe Chimique de La Grande Paroisse et Produits Chemiques: *See—*
Senes, Michel; Lhonore, Pierre; Pottier, Michel; and Quibel, Jacques, 3,947,554.

Societe D'Assistance Technique Pour Produits Nestle, S.A.: *See—*
Kleemann, Thomas; and Rothmayr, Willy, 3,947,166.

Societe des Aciers Fins de l'Est: *See—*
Sartorius, Guy, 3,946,610.

Societe des Procedes Modernes d'Inject Sopromi: *See—*
Monpetit, Louis, 3,946,709.

Societe Francaise D'Electrometallurgie: *See—*
Charlot, Gaston, 3,947,542.

Societe Nationale des Petroles Aquitaine: *See—*
Amiard, Yves; Bellissent, Jean -Paul; and Marie, Gilbert, 3,947,430.

Sodaro, Alfred C., to Scientific Developments, Inc. Mold for recycled rubber articles. 3,947,213, Cl. 425-451.900.

Soileau, Marion J.: *See—*
Bennett, Harold E.; Soileau, Marion J.; and Hutcheson, Guilford J., 3,947,127.

Sokolow, Nickolas N., to Beloit Corporation. Oven with parison rotating means. 3,947,243, Cl. 432-124.000.

Sokolow, Nickolas N.: *See—*
Daane, Robert A.; Beachler, Edward D.; Vonderau, Raymond C.; and Sokolow, Nickolas N., 3,946,502.

Solberg, Thomas M.; and Hamil, Donald W., to Champion International Corporation. Heat seal capper head assembly. 3,946,540, Cl. 53-341.000.

Solodovnik, Nikolai Pavlovich: *See—*
Baklanov, Nikolai Mikhailovich; Buslakova, Ljubov Pavlovna; Nekorystnova, Raisa Mikhailovna; Novikov, Anatoly Artemievich; Repenkova, Tatyana Grigorievna; Rumyantsev, Ivan Ivanovich; Sapogova, Galina Alexandrovna; Solodovnik, Nikolai Pavlovich; and Fridman, Viktor Mironovich, 3,947,262.

Solomons, William Ebenezer: *See—*
Mathison, Ian William; Solomons, William Ebenezer; and Jones, Raymond Henry, 3,947,454.

Soloviev, Valery Vladimirovich: *See—*
Bolshov, Vladimir Mikhailovich; Voinov, Vyacheslav Evgenievich; Kletskin, Solomon Zalmanovich; Ostrovsky, Viktor Julievich; Soloviev, Valery Vladimirovich; and Ter-Kasparova, Nina Yakovlevna, 3,946,725.

Sommer, Gordon M., to G. M. Sommer Company, Inc. Flywheel clutch assembly with brake. 3,946,840, Cl. 192-18.00A.

Somos, Istvan: *See—*
DeCecco, Angelo L.; Demarest, Donald M.; Piccone, Dante E.; and Somos, Istvan, 3,947,726.

Sonoco Products Company: *See—*
Turnage, Richard W., 3,946,866.

Sony Corporation: *See—*
Amari, Shinji; and Yamagiwa, Kazuo, 3,947,871.
Arai, Michio, 3,947,761.
Chimura, Toshihiko, 3,947,894.
Saito, Makoto; Matsumoto, Kengo; and Hayakawa, Kiyonori, 3,947,891.

Sopova, Alexandra Semenovna: *See—*
Perekalin, Vsevolod Vasilievich; Sopova, Alexandra Semenovna; Zobacheva, Maiva Mikhailovna; Spunde, Rasma Yanovna; Mikstais, Uldis Yanovich; and Silaya, Maiya Petrovna, 3,947,492.

Sotman, Kurt; and Lewis, Richard P., to Star Dental Manufacturing Co., Inc. Lubrication system for dental handpiece. 3,946,490, Cl. 32-28.000.

Sousek, Eugene A., to Koehring Company. Single blade recutter for forage harvester. 3,946,954, Cl. 241-222.000.

Spangler, Larry D.: *See—*
Matter, Robert C.; and Spangler, Larry D., 3,947,290.

Spann, Donald C. Limb support. 3,946,451, Cl. 5-327.00R.

Specht, Glenn E., to A-T-O Inc. Pressure control valve. 3,946,756, Cl. 137-495.000.

Spencer, Claude F.; and Snyder, Harry R., Jr., to Morton-Norwich Products, Inc. 9-(P-phenylazoanilino)-7-methyl-1H-imidazo[4,5-f]quinolines. 3,947,434, Cl. 260-155.000.

Sperber, Nathan: *See—*
Sherlock, Margaret H.; and Sperber, Nathan, 3,947,588.

Sperry Rand Corporation: *See—*
Locke, David R.; and Szymansky, Edward, 3,946,486.
Mumme, Clarence D., 3,947,682.

Spicuzza, William F.: *See—*
Moss, Robert H.; and Spicuzza, William F., 3,947,553.

Spitzer, Henry W. Tip cat apparatus including target areas. 3,947,032, Cl. 273-95.00F.

Sponer, Gisbert: *See—*
Witte, Ernst-Christian; Stach, Kurt; Dietmann, Karl; and Sponer, Gisbert, 3,947,446.

Spunde, Rasma Yanovna: *See—*
Perekalin, Vsevolod Vasilievich; Sopova, Alexandra Semenovna; Zobacheva, Maiva Mikhailovna; Spunde, Rasma Yanovna; Mikstais, Uldis Yanovich; and Silaya, Maiya Petrovna, 3,947,492.

Staadt, Harold E.: *See—*
Hradel, Joseph R.; and Staadt, Harold E., 3,947,301.

Stach, Kurt: *See—*
Kaiser, Fritz; Schaumann, Wolfgang; Stach, Kurt; and Voigtlander, Wolfgang, 3,947,404.
Witte, Ernst-Christian; Stach, Kurt; Dietmann, Karl; and Sponer, Gisbert, 3,947,446.

Stadhouders, Jacobus J.: *See—*
Driessen, Fransiscus M.; Stadhouders, Jacobus J.; and Ubbels, Jacob, 3,946,657.

Staggs, Alvin D. Bed-making device. 3,946,450, Cl. 5-317.00R.

Stahl, Werner: *See—*
Stievenart, Emile Frans; Muller, Jurgen; and Stahl, Werner, 3,947,856.

Stal-Laval Turbin AB: *See—*
Lohonen, Paavo, 3,947,150.

Stalfors, Rolf Lennart, to AB Bofors. Power-generating device for a projectile, shell, etc. 3,946,675, Cl. 102-70.20G.

Stalfors, Rolf Lennart: *See—*
Pettersson, Henry Gustaf Erland; Skagerlund, Lars-Erik; and Stalfors, Rolf Lennart, 3,946,674.

Stallard, David V., to Raytheon Company. Apparatus and method for aerodynamic cross-coupling reduction. 3,946,968, Cl. 244-3.210.

Stamberger, Paul, to Union Optics Corporation. Hydrogels of unsaturated ester copolymers. 3,947,401, Cl. 260-29.60H.

Stamicarbon, B.V.: *See—*
Alfenaar, Marinus; and Jadoul, Desire J. N., 3,947,419.

Standard Oil Company: *See—*
Chao, Kwei C., 3,947,605.
Corkhill, David P.; and Freeman, Francis R., 3,947,806.
Kuhlmann, George E., 3,947,494.
Leroux, Pierre J.; and de Schilde, D. van de Werve, 3,947,305.
Li, George S.; and Coffey, Gerald P., 3,947,527.

Stanford Research Institute: *See—*
Henry, David W.; and Sturm, Priscilla A., 3,947,445.

Stange, Klaus K., to Xerox Corporation. Universal feeder-stacker. 3,947,018, Cl. 271-99.000.

Stanley Works, The: *See—*
Fyler, Norman F., 3,947,734.

Stanzwerk Peitz & Co.: *See—*
Griefahn, Hans-Joachim, 3,947,067.

Star Dental Manufacturing Co., Inc.: *See—*
Sotman, Kurt; and Lewis, Richard P., 3,946,490.

Staroba, Miro O.; and Suchostawaski, Alex, to V-Master Limited. Cigarette cutting tray. 3,946,747, Cl. 131-46.000.

Statni vyzkumny ustav kozedelny: *See—*
Kremr, Milan; and Hrabovsky, Vaclav, 3,947,316.

Stauch, Hans: *See—*
Bechstein, Herbert; Biebl, Herbert; Eckell, Wolfgang; Franz, Anton; Hofmann, Eberhard; Stauch, Hans; Staudt, Heinrich; Tomasch, Hellmut; Urlberger, Alois; and Winnewisser, Theodor, 3,946,590.

Staudt, Heinrich, to Robert Bosch GmbH. Centrifugal rpm governor for fuel injected internal combustion engines. 3,946,715, Cl. 123-140.00R.

Staudt, Heinrich: *See—*
Bechstein, Herbert; Biebl, Herbert; Eckell, Wolfgang; Franz, Anton; Hofmann, Eberhard; Stauch, Hans; Staudt, Heinrich; Tomasch, Hellmut; Urlberger, Alois; and Winnewisser, Theodor, 3,946,590.

Stauffer Chemical Company: *See—*
Baker, Don R., 3,947,461.
Baker, Don R., 3,947,481.
DeBaun, Jack R.; Pallos, Ferenc M.; and Baker, Don R., 3,947,475.

Stauffer, Norman L., to Honeywell Inc. Multi-color recording medium responsive to force fields and apparatus for recording on the medium. 3,947,879, Cl. 360-56.000.

Steelcase Inc.: *See—*
Buhk, Randall P., 3,947,068.

Steiner American Corporation: *See—*
Bahnsen, Erwin B., 3,946,961.

Steiner, Edward L.: *See—*
Jordan, William E.; Steiner, Edward L.; and Fiske, Kenton W., 3,946,920.

Steinle, Leo D. Emergency illumination. 3,947,677, Cl. 240-8.10R.

Stellrecht, Hans H., to Signetics Corporation. Ion implanted resistor having controlled temperature coefficient and method. 3,947,866, Cl. 357-51.000.

Stenlund, Hans, to Gotaverken Angteknik AB. Means for burning a liquid fuel. 3,947,228, Cl. 431-121.000.

Stenne, Pierre, to Claudel S.A. Manufacture of protein foods. 3,947,598, Cl. 426-36.000.

Stepanek, Frank N., Jr., to Aspen Industries, Inc. Automatic feeder for infusion of a soluble solid solute into a circulating solvent. 3,946,902, Cl. 222-64.000.

Stern, Thomas E.: *See—*
Desblache, Andre E.; and Stern, Thomas E., 3,947,768.

Stevens, Daniel A.; Logis, John, Jr.; and Scheerer, Ronald C., to United States of America, Air Force. Inductive load driver with fast switching capability. 3,947,776, Cl. 328-147.000.

Stevenson, William David, to Brown Brothers & Company Limited. Heave compensating devices for marine use. 3,946,559, Cl. 60-413.000.

Stewart, Roger Green, to RCA Corporation. Protection circuit for insulated-gate field-effect transistors. 3,947,727, Cl. 317-31.000.

Stiching Bedrijven Van Het Nederlands Instituut Voor Zuivelonderzoek: *See—*
Driessen, Fransiscus M.; Stadhouders, Jacobus J.; and Ubbels, Jacob, 3,946,657.

Stiefel, Christian; and Frederich, Fritz, to Waggonfabrik Uerdingen A.G. Railway switch construction for suspended railroad using two-runway-rail suspension rails. 3,946,974, Cl. 246-415.00R.

Stievenart, Emile Frans; Muller, Jurgen; and Stahl, Werner, to Agfa-Gevaert AG. Equipment for controlling the supply of fresh liquid in liquid treatment of photographic emulsion carriers. 3,947,856, Cl. 354-324.000.

Stig Ravn A/S: *See—*
Ravn, Ole Stig, 3,946,914.

Stillerud, Karl Gustav Herman; and Ohman, Allan. Hollow hub marine propeller with anticavitation groove. 3,947,151, Cl. 416-93.00A.

Stilli, Adrian: *See—*
Roehrig, Adalbert; Zeller, Josef; and Stilli, Adrian, 3,946,630.

Stocker, Jean, to Compresseurs S.A. Rotatable machine operating as a compressor or a motor. 3,947,164, Cl. 418-233.000.

Stockton, Ralph H.: *See—*
Echols, Marvin; and Stockton, Ralph H., 3,946,455.

Stoddard, William H.: *See—*
Chadbourne, Barry O.; and Stoddard, William H., 3,946,685.

Stoll, Karl-Heinz A., to Vosswerke GmbH. Washing machine drum-shaving rotary feed worm. 3,946,580, Cl. 68-145.000.

Stoll, Max: *See—*
Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., 3,947,603.

Stolov, Lev Isaakovich: *See—*
Alien, Imant Karlovich; Popov, Jury Olegovich; Stolov, Lev Isaakovich; Yanson, Boris Albertovich; Markov, Igor Alexandrovich; and Nikonenko, Anatoly Vasilievich, 3,947,628.

Stone, William S.: *See—*
Bailey, Russell O.; and Stone, William S., 3,946,491.
Storage Technology Corporation: *See—*
Platter, Sandford, 3,947,887.
Story Chemical Corporation: *See—*
Lander, Harry L., 3,947,426.
Stotz, Wolf Gunter; and Hildebrand, Otto, to Sulzer Brothers Limited. Apparatus for adjusting and indicating position of a breast box lip. 3,947,317, Cl. 162-263.000.
Stout, Edward L.: *See—*
Mac Intosh, Donald J.; and Stout, Edward L., 3,946,560.
Stoveken, James N.; and Glokner, Mary L., to Lawrence Peska Associates, Inc., a part interest. Message holder rack. 3,946,878, Cl. 211-124.000.
Stowell Industries, Inc.: *See—*
Fischer, Otto H.; and Schoenke, Donald F., 3,946,750.
Strain, Robert Allen; and Schurter, Gary Lee, to International Telephone and Telegraph Corporation. Gas-insulated switch for an underground power distrubution system. 3,947,650, Cl. 200-148.00B.
Strasser, Werner, to Texas Instruments Incorporated. Thermostatic disc seat forming calibration process and apparatus. 3,946,589, Cl. 73-1.00F.
Strateurop S.A.: *See—*
Casset, Jacques G., 3,947,141.
Strickland, Charles Irvin: *See—*
Keyes, John Harold; Strickland, Charles Irvin; and Strickland, Robert George, 3,946,720.
Keyes, John Harold; Strickland, Charles Irvin; and Strickland, Robert George, 3,946,721.
Keyes, John Harold; Strickland, Charles Irvin; and Strickland, Robert George, 3,946,944.
Strickland, Robert George: *See—*
Keyes, John Harold; Strickland, Charles Irvin; and Strickland, Robert George, 3,946,720.
Keyes, John Harold; Strickland, Charles Irvin; and Strickland, Robert George, 3,946,721.
Keyes, John Harold; Strickland, Charles Irvin; and Strickland, Robert George, 3,946,944.
Strom, Richard Albert; Mayer, William Norman; and Johnson, Robert Wallace, to Control Data Corporation. Electronic scan methods for plasma displays. 3,947,722, Cl. 315-169.0TV.
Stuber, Fred A.: *See—*
Peters, Gerret M., Jr.; Stuber, Fred A.; and Ulrich, Henri, 3,947,337.
Stuber, Ivan L. Method and means for installing a post. 3,946,569, Cl. 61-53.500.
Stumpp, Gerhard: *See—*
Eckert, Konrad; and Stumpp, Gerhard, 3,946,714.
Sturm, Priscilla A.: *See—*
Henry, David W.; and Sturm, Priscilla A., 3,947,445.
Sturm, Winfried Gerhard, to Alcan Aluminum Corporation. Sealable and sterilizable package. 3,946,871, Cl. 206-498.000.
Sturm, Winfried Gerhard, to Alcan Aluminum Corporation. Sealable and sterilizable package. 3,946,872, Cl. 206-498.000.
Sturmath, Rainer: *See—*
Jarchow, Friedrich G. K.; Haensel, Dietrich; Hempelmann, Willi; Sturmath, Rainer; Ringleben, Hans; and Knabel, Walter, 3,947,311.
Subrizi, Angelo: *See—*
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Suchostawaski, Alex: *See—*
Staroba, Miro O.; and Suchostawaski, Alex, 3,946,747.
Sudo, Masashi: *See—*
Yasuda, Kazuyoshi; Tsuboi, Tokishige; and Sudo, Masashi, 3,947,171.
Sudol, Daniel H., to Raymond Lee Organization, Inc., The, a part interest. Nail guide. 3,946,779, Cl. 145-46.000.
Suenami, Keniti; Shimizu, Kazuhiko; and Ogata, Kazuo, to Matsushita Electric Industrial Company, Ltd. Liquid crystal device. 3,947,721, Cl. 315-169.0TV.
Sugar Cane Growers Cooperative of Florida: *See—*
Fowler, Larry G., 3,946,875.
Sukup, Eugene G. Control system for grain drying bin. 3,946,496, Cl. 34-56.000.
Sullair Corporation: *See—*
Olsaker, Oleif, 3,947,078.
Sullivan, Bernard P.: *See—*
Dey, Arabinda; N.; and Sullivan, Bernard P., 3,947,289.
Sulzer Brothers Limited: *See—*
Stotz, Wolf Gunter; and Hildebrand, Otto, 3,947,317.
Sumihana, Takahiro: *See—*
Kimura, Takashi; Ogita, Toshiyuki; and Sumihana, Takahiro, 3,947,737.
Sumitomo Chemical Company, Ltd.: *See—*
Akamatsu, Takashi; Koga, Koichi; Kondo, Mitsuru; Miyake, Makoto; Twasaki, Hiroshi; Matsuo, Masatoshi; Hotta, Seiji; Yuji, Isao; and Ito, Yukiaki, 3,947,471.
Matsui, Masanao; Horiuchi, Fukashi; Hirai, Hajime; and Itaya, Nobushige, 3,947,519.
Sagawa, Seiji; Nakagawa, Tsunehiko; Yoshida, Osamu; Mori, Kenjiro; and Ebisutani, Junichi, 3,947,429.
Sumitomo Shipbuilding & Machinery Co., Ltd.: *See—*
Yamamoto, Kiichiro; and Toyosumi, Shigeru, 3,946,620.
Sumner, Maurice N. Semi-submersible jackup apparatus. 3,946,684, Cl. 114-0.50D.
Sun Oil Company of Pennsylvania: *See—*
Hansel, William B., 3,946,773.
Hansel, William P., 3,946,758.
Sunbeam Plastics Corporation: *See—*
Gach, Peter P., 3,946,889.
Sundberg, Carl Axel, to C. A. Sundberg AB. Free-burning equipment. 3,947,233, Cl. 431-328.000.
Sundberg, Yngve: *See—*
Collin, Per Harald; and Sundberg, Yngve, 3,947,621.
Sundstrand Corporation: *See—*
Mac Intosh, Donald J.; and Stout, Edward L., 3,946,560.
Santo, Eugenio Espiritu, 3,947,219.
Sundstrand Data Control, Inc.: *See—*
Bateman, Charles Donald, 3,947,808.
Bateman, Charles Donald, 3,947,809.
Bateman, Charles Donald; and Muller, Hans Rudolf, 3,947,810.
Superior Iron Works & Supply Company, Inc.: *See—*
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Sureau, Robert Frederic Michel: *See—*
Pechmeze, Jacques Pierre Edmond; Sureau, Robert Frederic Michel; and Brouard, Claude Marie Henri Emile, 3,947,435.
Surinx, Hubertus Joannes Josephus, to Electro-Nite Co. Disposable phase change device. 3,946,594, Cl. 73-17.00R.
Suto, Ken: *See—*
Nishizawa, Jun-Ichi; Suto, Ken; and Okuno, Yasuo, 3,947,548.
Sutter, Jean Georges, to Pont-a-Mousson S.A. Motor-driven control device for a valve rod. 3,946,984, Cl. 251-130.000.
Sutter, Jean Georges; and Depoisson, Jean Pierre, to Pont-A-Mousson S. A. Flow regulating valve. 3,946,986, Cl. 251-298.000.
Sutton, Blaine M.; and Weinstock, Joseph, to SmithKline Corporation. Anti-arthritic compositions comprising s-heterocyclic derivatives of phosphine or phosphite gold mercaptides and methods of producing anti-arthritic activity. 3,947,565, Cl. 424-200.000.
Sutton, Walter T., to Texas Instruments Incorporated. Disc thermostat test system and method. 3,947,758, Cl. 324-28.00R.
Suyama, Tadashi: *See—*
Misato, Tomomasa; Huang, Keng Tang; Homma, Yasuo; Kanao, Seizo; Toyoda, Takeshi; Suyama, Tadashi; and Shida, Toshiro, 3,947,589.
Suzuki, Shoji, to Alps Motorola, Inc. Indicator device for slot-in type cassette tape recorder. 3,947,883, Cl. 360-93.000.
Suzuki, Shoji, to Alps Motorola, Inc. Magnetic tape recorder. 3,947,895, Cl. 360-137.000.
Suzuki, Takahiko: *See—*
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Suzuki, Yasoji, to Tokyo Shibaura Electric Co., Ltd. Logical circuit apparatus. 3,947,829, Cl. 340-173.50P.
Suzuki, Yoshihisa: *See—*
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Swanson, Allan R.: *See—*
Needles, Stanton D.; and Swanson, Allan R., 3,946,619.
Swanson, Charles L.; Wing, Robert E.; and Doane, William M., to United States of America, Agriculture. Removal of heavy metal ions from wastewater. 3,947,354, Cl. 210-53.000.
Sweeney, William M., to Texaco Inc. Lubricating oil compositions. 3,947,368, Cl. 252-56.00R.
Swered, Paul; and Michael, Dana U., to Betz Laboratories, Inc. Synergistic compositions containing 1,3-dichloroacetone oxime acetate and specific isothiazolin-3-one compounds and their use. 3,947,581, Cl. 424-270.000.
Swift, Harold E.: *See—*
Kobylinski, Thaddeus P.; and Swift, Harold E., 3,947,483.
Swinehart, Frank, to E. F. Johnson Company. Microphone having improved transducer support. 3,947,647, Cl. 179-179.000.
Swiss Aluminium Limited: *See—*
Guzowski, Matthew M.; Bishop, E. Dennis; and Setzer, William C., 3,947,265.
Pryor, Michael J.; and Gray, Thomas J., 3,947,363.
Switchcraft, Inc.: *See—*
Lutzenberger, Kurt, 3,947,391.
Sylvester, Merton E. Earth working apparatus. 3,946,681, Cl. 111-7.000.
Syntex Corporation: *See—*
Fried, John H.; and Harrison, Ian T., 3,947,472.
Syntex (U.S.A.) Inc.: *See—*
Rooks, Wendell H., II, 3,947,479.
Synthetic Chemicals Limited: *See—*
Clarke, James A.; and Meth-Cohn, Otto, 3,947,336.
Syria, Ronald L., to Borg-Warner Corporation. Frequency doubling circuit for automotive control system. 3,947,702, Cl. 307-271.000.
Szatkowski, Richard R., to Continental Can Company, Inc. Apparatus for making tubular containers. 3,947,165, Cl. 425-3.000.
Sze, Morgan C.: *See—*
Brooks, Maurice E.; Riegel, Herbert; Schindler, Harvey D.; and Sze, Morgan C., 3,947,489.
Szwarc, John J.: *See—*
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Szymansky, Edward: *See—*
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Tadokoro, Takaya, to Tsukishima Kikai Co., Ltd. Centrifugal basket. 3,946,940, Cl. 233-2.000.
Tahbaz, John A., to Purex Corporation. Flaw penetrant test panel. 3,946,597, Cl. 73-53.000.
Takahashi, Kazutoshi: *See—*
Miyazaki, Ken; Kubota, Narumi; Igarashi, Kooichi; Sato, Hiroshi;

Takahashi, Kazutoshi; Maki, Takeshi; Hatano, Akira; and Kai, Masamitsu, 3,946,625.

Takahashi, Shigeo: *See—*
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Takahashi, Susumu: *See—*
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Takano, Kazuro; Hirata, Masakuni; and Kodera, Yasuo, to Matsushita Electric Industrial Co., Ltd. Diaphragm for loud speaker. 3,946,832, Cl. 181-167.000.

Takanohashi, Hiromitsu: *See—*
Hozumi, Yukio; Ohi, Akira; Toga, Yuzo; Yoshizaki, Hiroyuki; Takanohashi, Hiromitsu; and Masuda, Yoshitaka, 3,947,524.

Takase, Iwao: *See—*
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Takashi Tumura: *See—*
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Takata, Harry H.; and Bauer, Norman A., to Raygo, Inc. Articulated pavement compacting machine. 3,947,142, Cl. 404-126.000.

Takechi, Hiroshi; Ozaki, Koji; Namba, Kazuo; and Komiya, Kunihiko, to Nippon Steel Corporation. Method for producing high-strength cold rolled steel sheet. 3,947,293, Cl. 148-12.00F.

Takeda Chemical Industries, Ltd.: *See—*
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Takekata, Kiyoshi: *See—*
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Takeuchi, Hiroshi: *See—*
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Tamarkin, David. Guitar music card clip. 3,946,980, Cl. 248-443.000.

Tamura, Minoru: *See—*
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Tanaka, Atsuyuki: *See—*
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Tanaka, Susumu; Enoguchi, Yuji; and Kawabata, Hidetoshi, to Minolta Camera Kabushiki Kaisha. Copy paper sheet separating device. 3,947,019, Cl. 271-174.000.

Tanaka, Toshihide; Fujisawa, Seiji; and Ide, Susumu, to Matsushita Electric Industrial Company, Ltd. Television receiver I. F. circuitry. 3,947,629, Cl. 178-7.30R.

Tanaka, Yutaka, to Matsushita Electric Industrial Company, Limited. Facsimile system. 3,947,627, Cl. 178-7.100.

Tanigaichi, Mineaki: *See—*
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Isa, Hiroshi; Ukigai, Toshiyuki; Tominaga, Anri; Taniyasu, Ryozo; and Nagayama, Masuzo, 3,947,509.

Tanner, Troy. Portable winch device. 3,946,990, Cl. 254-164.000.

Tapmatic Corporation: *See—*
Johnson, Allan S., 3,946,844.

Tate, Jack F.; Maddox, Jim, Jr.; and Shupe, Russell D., to Texaco Inc. Method for stimulating well production. 3,946,813, Cl. 166-307.000.

Tate, Jack F.: *See—*
Shupe, Russell D.; Maddox, Jim, Jr.; and Tate, Jack F., 3,946,814.

Tatsuno, Yujiro: *See—*
Otubo, Osamu; Tatsuno, Yujiro; Ikeda, Takatoshi; and Tsubaki, Toshio, 3,947,190.

Tatum, Sammy Duane; and Hawkins, Jerry Marvin, to Dow Chemical Company, The. Low profile molding composition and process for making same. 3,947,422, Cl. 260-42.520.

Taupin, Dominique Yves Marie: *See—*
Perilhou, Jean Robert; Simeon, Michel Jacques; and Taupin, Dominique Yves Marie, 3,947,626.

Tawada, Hiroyuki: *See—*
Kuwada, Yutaka; Tawada, Hiroyuki; and Meguro, Kanji, 3,947,417.

Tawara, Yoshio; and Senno, Harufumi, to Matsushita Electric Industrial Co., Ltd. Hard magnetic material. 3,947,295, Cl. 148-31.570.

Tayco Developments, Inc.: *See—*
Taylor, Douglas P., 3,947,004.

Taylor, Alwyn H., to United States of America, Interior. Scale inhibition. 3,947,341, Cl. 204-181.000.

Taylor, Charles R.: *See—*
d'Entremont, John C.; and Taylor, Charles R., 3,947,267.

Taylor, Douglas P., to Tayco Developments, Inc. Liquid spring, vehicle suspension system and method for producing a low variance in natural frequency over a predetermined load range. 3,947,004, Cl. 267-65.00R.

Taylor, Edward C.; and McKillop, Alexander. O-Acylation using organothallium compounds. 3,947,488, Cl. 260-473.00A.

Taylor, Malcolm Arthur: *See—*
Weeks, Wilfred Gwyn; and Taylor, Malcolm Arthur, 3,946,581.

Taylor, Walter F.; Rodgers, William G., Jr.; and Chappell, John R., to Newport News Shipbuilding and Drydock Company. Conical bulbous bow. 3,946,687, Cl. 114-56.000.

Technical Operations, Incorporated: *See—*
Smith, Albert Ernest, 3,947,105.

Technion Research and Development Foundation, Ltd.: *See—*
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Telefunken Patentverwertungsgesellschaft m.b.H.: *See—*
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Temco Products, Inc.: *See—*
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Templeton, William E. Power mower with hydraulic drive. 3,946,543, Cl. 56-10.900.

Tenneco Inc.: *See—*
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Tension Envelope Corporation: *See—*
Kranz, Richard, 3,946,938.

Tensmeyer, Lowell G., to Eli Lilly and Company. Cefamandole derivatives. 3,947,414, Cl. 260-243.00C.

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Teodorescu, Constantin Gh.; Chiriac, Ilie C.; Adam, Constantin I.; Diaconescu, Marin R.; Dragan, Nicolae T.; and Ber, Wilhelm F., to Institutul Pentru Creatie Stiintifica Si Tehnica. Burner for liquid fuels. 3,947,216, Cl. 431-352.000.

Ter-Kasparova, Nina Yakovlevna: *See—*
Bolshov, Vladimir Mikhailovich; Voinov, Vyacheslav Evgenievich; Kletskin, Solomon Zalmanovich; Ostrovsky, Viktor Julievich; Soloviev, Valery Vladimirovich; and Ter-Kasparova, Nina Yakovlevna, 3,946,725.

Terrell, Ross C., to Airco, Inc. 2.2 Dichloro -1,1,-difluoroethyl-1,2,2,2-tetrofluoroethyl ether as an inhalation anesthetic. 3,947,595, Cl. 424-342.000.

Tesch, Charles L., to Methode Electronics, Inc. Surge protector terminal assembly. 3,947,729, Cl. 317-61.500.

Tewes, Giesbert: *See—*
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Textron, Inc.: *See—*
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Moertel, George B., 3,946,465.

Thalmann, Armin, to Concast AG. Method of operating a continuous casting installation with compensation of deviations in water vapor pressure. 3,946,792, Cl. 164-4.000.

Thalmann, Armin, to Concast AG. Arrangement for cooling and supporting a continuously cast metal strand. 3,946,797, Cl. 164-282.000.

Thermo Electron Corporation: *See—*
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Theurich, Gordon R., to United States of America, Energy Research and Development Administration. Gas centrifuge purge method. 3,946,942, Cl. 233-40.000.

Thiebaut, Jean-Jacques, to Thomson-CSF. Phase and frequency comparator. 3,947,775, Cl. 328-133.000.

Thiel, Reinhold; Zinsstag, Christoph; and Faschinger, Gunther, to Lonza, Ltd. Process for recovering copper and noble metals from organic residues. 3,947,543, Cl. 423-22.000.

Thiemann, Hans: *See—*
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Thiokol Corporation: *See—*
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Macbeth, Albert William, 3,946,557.

Thole, James Arthur: *See—*
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Thomas & Betts Corporation: *See—*
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Thomas, Joseph Edward: *See—*
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Thomas, Morton I., to Temco Products, Inc. Connector for telescoping tubular stick members. 3,947,140, Cl. 403-108.000.

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Thompson, James P., to Lockheed Missiles & Space Company, Inc. Low power high frequency horizontal deflection amplifier. 3,947,723, Cl. 315-389.000.

Thompson, William B.; and Conklin, James T., to Penetryn System, Inc., The. Packer for sealing pipe leaks. 3,946,761, Cl. 138-98.000.

Thomson-CSF: *See—*
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Thomson Medical-Telco: *See—*
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Thunberg, Jon Carl; Bragdon, Robert Wright; and Moore, William Philip, to W. R. Grace & Co. Process for recovering glycine from sodium sulfate solutions. 3,947,496, Cl. 260-534.00R.

Thurn, Friedrich: *See—*
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Tiedemann, Hugo: *See—*
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Tiefert, Karl H., to Raytheon Company. Method of forming junction regions utilizing R.F. sputtering. 3,947,298, Cl. 148-175.000.

Tielrooy, Hans: *See—*
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Tikhonova, Vera Viktorovna; Markov, Alexandr Ivanovich; Gerasimova, Marina Andreevna; Zhukova, Galina Ivanovna; Altman, Morits Borisovich; Timonova, Margarita Alexandrovna; Ershova, Tatyana Ivanovna; Krysin, Boris Trofimovich; Kitari-Oglu, Georgy Gerasimovich; Morozova, Galina Ivanovna; and Lashko, Nikolai Fedorovich. Magnesium-base alloy. 3,947,268, Cl. 75-168.00B.

Timonova, Margarita Alexandrovna: *See—*
Tikhonova, Vera Viktorovna; Markov, Alexandr Ivanovich; Gerasimova, Marina Andreevna; Zhukova, Galina Ivanovna; Altman, Morits Borisovich; Timonova, Margarita Alexandrovna; Ershova, Tatyana Ivanovna; Krysin, Boris Trofimovich; Kitari-Oglu, Georgy Gerasimovich; Morozova, Galina Ivanovna; and Lashko, Nikolai Fedorovich, 3,947,268.

Tims, Allan C.; and Henriquez, Theodore A., to United States of America, Navy. Omnidirectional low noise piezoelectric transducer. 3,947,802, Cl. 340-10.000.

Tischler, Edward J., to Ecodyne Corporation. Pressure switch brine shut-off. 3,946,753, Cl. 137-268.000.

Tkach, Grigory Anatolievich; Smolyak, Vsevolod Dmitrievich; Frumin, Vitaly Moiseevich; and Klimor, Anatoly Grigorievich. Plate heat exchanger. 3,946,804, Cl. 165-167.000.

Tobben, Johannes Hubertus: *See—*
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Toga, Yuzo: *See—*
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Tokico Ltd.: *See—*
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Tomek, Warren Lee, to Du Pont de Nemours, E. I., and Company. Polyamidation process. 3,947,424, Cl. 260-45.75C.

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Tongyai, Singkata: *See—*
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Tonkin, Shirley Lyford. Artificial baby feeding. 3,946,888, Cl. 215-11.00B.

Torgrim, Willard J.: *See—*
Nicholas, David C.; Torgrim, Willard J.; and Kleitsch, John C., 3,947,639.

Torres, John J. Drill sight for an electric hand drill. 3,946,493, Cl. 33-263.000.

Torres, Ruben J. Combination plier, wrench and screwdriver tool. 3,946,453, Cl. 7-4.000.

Toshimitsu, Tohoru: *See—*
Asamura, Takashi; Sawai, Shigeki; Sakamoto, Keisuke; Ikeda, Hajime; and Toshimitsu, Tohoru, 3,947,294.

Totsu Co. Ltd.: *See—*
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Towne, Robin M.; and Champ, Stanley G., to Robin M. Towne and Associates, Inc. Method and apparatus for determining the dynamic parameters of soil in situ. 3,946,598, Cl. 73-67.100.

Townsend, Keith Gerald; and Keel, Frederick, to Bentley Engineering Co. Ltd., The. Method of knitting an elasticised welt. 3,946,577, Cl. 66-14.000.

Toyo Boseki Kabushiki Kaisha: *See—*
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Toyoda, Takeshi: *See—*
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Toyosumi, Shigeru: *See—*
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Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
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Yamada, Mitsumasa; and Kitamura, Youji, 3,947,544.

Traver, William S.: *See—*
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Travot, Guy Claude Daniel; and Sirand-Rey, Gerard Rene, to Eastman Kodak Company. Magneto-optical readout apparatus. 3,947,890, Cl. 360-114.000.

Trcka, James S., to Rockwell International Corporation. Reflective display apparatus. 3,947,091, Cl. 350-160.0LC.

Trell, Anders Edvard. Use of public subscriber telephone network; method and apparatus. 3,947,641, Cl. 179-2.00A.

Tri-Century Industries: *See—*
La Forge, Louis H., Jr., 3,947,838.

Tribbett, Murray C.; and Laug, George H., to French Oil Mill Machinery Company, The. Injection molding apparatus. 3,947,196, Cl. 425-248.000.

Trinne, John Thomas; and Wilksch, Leslie John. Bottle filling means and method. 3,946,770, Cl. 141-5.000.

Troster, Helmut: *See—*
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Troton, Jacques: *See—*
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Troutner, Arthur L., to Trus Joist Corporation. Pitched wooden truss with integral ridge connector. 3,947,309, Cl. 156-248.000.

Trus Joist Corporation: *See—*
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TRW Inc.: *See—*
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Tsubaki, Toshio: *See—*
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Tsuboi, Takashi, to Hitachi, Ltd. Regenerative brake control system for DC motor. 3,947,740, Cl. 318-376.000.

Tsuboi, Tokishige: *See—*
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Tsubouchi, Kaoru: *See—*
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Tsuchiya, Kyohei: *See—*
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Tsuchiya, Shozo; Murai, Yoshikazu; and Matubara, Saburo, to Nippon Oil Company. Process for the preparation of novel high chlorinated butyl rubber and vulcanizable composition thereof. 3,947,432, Cl. 260-79.30R.

Tsuda, Masao. Slow descender including fluid and mechanical braking devices. 3,946,989, Cl. 254-157.000.

Tsukagoshi, Yoichi; Tsuchiya, Kyohei; Inoue, Toshio; Ogawa, Toshihiko; Komori, Hideo; Murakami, Kyoichi; and Ayukawa, Taizo, to Kabushiki Kaisha Niigata Tekrosho. Method for decomposition of polymers into fuels. 3,947,256, Cl. 44-50.000.

Tsukamoto, Hiroyuki: *See—*
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Tsukishima Kikai Co., Ltd.: *See—*
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Tsuyama, Yoshizo. Clamp usable as jig and lifting clamp. 3,947,011, Cl. 269-249.000.

Tucker, Alan Cyril: *See—*
Kaye, Albert Edward; and Tucker, Alan Cyril, 3,947,440.

Tumolillo, Thomas A., to United States of America, Army. Channel electron multiplier signal detector and digitizer. 3,947,841, Cl. 340-324.00M.
Turnage, Richard W., to Sonoco Products Company. Cone nose protector. 3,946,866, Cl. 206-392.000.
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Uchimoto, Yoshikazu; and Fujimura, Kazuo, to Kobe Steel, Ltd. Cast piece guide roll segment in continuous casting equipment. 3,946,798, Cl. 164-282.000.
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van der Lely, Ary; and Bom, Cornelis Johannes Gerardus. Rotary harrows. 3,946,816, Cl. 172-65.000.
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van Muyen, Hendrik, to Blydenstein-Willink N.V. Foldable curtain screen or blind construction and a method for producing a curtain blind construction. 3,946,788, Cl. 160-84.00R.
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Waters, John L., to Raymond Lee Organization, Inc., The, a part interest. Marble game board with surface pockets. 3,947,034, Cl. 273-123.00R.

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Watson, Alan J.; and Guenther, Heinz R., to Texas Instruments Incorporated. Printer. 3,946,852, Cl. 197-53.000.

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Weijland, Bernard Hendrik; and Verkuijlen, Wilhelmus Hendricus Cornelis Gerardus, to U.S. Philips Corporation. Method of manufacturing semiconductor devices. 3,947,299, Cl. 148-187.000.

Weil, Willi, to Lever Brothers Company. Device for delivering items at certain intervals. 3,946,855, Cl. 198-34.000.

Weinberger, Zvi; and Kalisky, Avram. Pattern comparison. 3,947,128, Cl. 356-71.000.

Weinstein, Barry; and Riley, Edward Donald, to General Electric Company. Fuel injection apparatus. 3,946,552, Cl. 60-39.74R.

Weinstein, Berel: *See—*
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Weinstock, Joseph, to SmithKline Corporation. Anti-arthritic compositions comprising N-heterocyclic pulvinic acid amides and methods of producing anti-arthritic activity. 3,947,580, Cl. 424-270.000.

Weinstock, Joseph: *See—*
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Weiss, Gunther. Centrifuging apparatus. 3,946,941, Cl. 233-26.000.

Weiss, Robert L.: *See—*
Bull, Frederick W.; Leavitt, Richard A.; and Weiss, Robert L., 3,947,875.

Wells, Perry L., to Hewlett-Packard Company. Toroidal electrolytic angle transducer. 3,946,494, Cl. 33-366.000.

Wells, William R., to United Audio Visual Corporation. Apparatus for expanding channel output capacity. 3,947,819, Cl. 340-147.00P.

Wellworthy Limited: *See—*
Gazzard, Simon Thomas; and Hill, Harold Taylor, 3,947,607.

Welzel, Guenter: *See—*
Guenther, Ludwig; Welzel, Guenter; and Janausche, Rainer, 3,946,765.

Werhli, Alfons, to Maschinenfabrik Wifag. Arrangement for regulating the moistening solution mixture in a moistening solution preparation plant for an offset printing press. 3,947,356, Cl. 210-96.00R.

Werner, Wolfgang; Vogel, Peter; Tiedemann, Hugo; and Guthlein, Werner, to Boehringer Mannheim GmbH. Stabilized indicator compositions containing 9-γ-aminopropyl)-3-aminocarbazole. 3,947,377, Cl. 252-408.000.

Wessels, Johannes Hendrik: *See—*
Backers, Franciscus Theodorus; and Wessels, Johannes Hendrik, 3,947,880.

West, Thomas Summers, to National Research Development Corporation. Analytical spectroelectrochemistry. 3,947,124, Cl. 356-74.000.

West, Thomas Summers, to National Research Development Corporation. Atomic absorption and fluorescence spectroscopy. 3,947,125, Cl. 356-85.000.

Western Electric Company, Inc.: *See—*
Bahnck, Norman; Booth, Raymond H.; Boyer, John A.; and Monahan, Jack J., 3,946,931.
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Westrex Company Limited: *See—*
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Freeman, Harlan G.; Gillern, Maurice F.; and Smith, Harry A., 3,947,425.

Wheat, G. F. Roy, to Hold 'Em, Inc. Liquid feeder for animals. 3,946,703, Cl. 119-75.000.

Wheeler, Robert R. Bin closure supported closing mechanism. 3,946,909, Cl. 222-181.000.

Whelan, James M.; and Brook, Richard J., to University of Southern California. Oxidation catalyst. 3,947,380, Cl. 252-462.000.

Whirlpool Corporation: *See—*
Nichols, Duane C.; and Pearson, Samuel J., 3,946,573.

White, Charles S. Method of making a bondable low friction thread. 3,947,611, Cl. 427-177.000.

White Motor Corporation: *See—*
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White, Thomas: *See—*
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Whitely, Robert M.: *See—*
Hansen, Raymond J.; St. Jacques, Gerald A.; and Whitely, Robert M., 3,947,854.

Whitmer, Delbert O., to Iowa State University Research Foundation, Inc. Apparatus for selecting a predetermined portion of an analog signal and gating it to an output. 3,947,699, Cl. 307-235.00N.

Whittaker Corporation: *See—*
Dautremont, Joseph L., Jr.; and Schneider, William J., 3,947,827.

Widner, Rayburn K.: *See—*
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Wiener, Samuel G., Jr. Resilient picture frame construction. 3,946,511, Cl. 40-152.100.

Wigal, Voorhis F. Hydrogen fired ignition system for internal combustion engines. 3,946,711, Cl. 123-119.00E.

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Wightman, David Douglas, to British Gas Corporation. Apparatus for the collection and discharge of material. 3,947,071, Cl. 302-59.000.
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Wiklund, Klas Rudolf, to AGA Aktiebolag. Apparatus for contactless measuring of the dimensions of objects. 3,947,129, Cl. 356-159.000.
Wilce, Brian J. Elongate units suitable for use as furnace skids or the like. 3,946,763, Cl. 138-147.000.
Wild, Jost; and Huber, Ulrich, to Givaudan Corporation. Process for making neohesperidine dihydrochalcone. 3,947,405, Cl. 260-210.00F.
Wilke, Wilbur D.: *See*—
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Williams, Harrison L., to Preformed Line Products Co. Limited contact separator for linear bodies. 3,947,623, Cl. 174-146.000.
Williams, John. Surfacing composition containing aqueous resin emulsion and calcium sulfate hemihydrate plaster. 3,947,398, Cl. 260-29.60S.
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Witte, Ernst-Christian; Stach, Kurt; Dietmann, Karl; and Sponer, Gisbert, to Boehringer Mannheim GmbH. Novel 1-[3-(5,6,7,8-tetrahydronaphth-1-yloxy)-propyl]-piperazine compounds and therapeutic compositions. 3,947,446, Cl. 260-268.0BC.
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Wolff, Anthony P., to Uniroyal, Inc. Drum cover made from thermoplastic rubber. 3,946,897, Cl. 220-306.000.
Wolff, Otto J.; and Nungesser, Harvey, to Allied Chemical Corporation. Apparatus for making rods or tubes having a filter. 3,947,169, Cl. 425-71.000.
Wolsing, Wilhelm: *See*—
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Wolters, Wouter K.: *See*—
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Woods, Gilbert Frederick; Cairns, James; and McGarry, George, to Akzona Incorporated. Alkylated 3,20-diketo-Δ^4-steroids of the pregnane series. 3,947,478, Cl. 260-397.300.
Woodworth, Fred G.: *See*—
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Wright, William Blythe, Jr., to American Cyanamid Company. Pyrrolobenzodiazepines, method of preparation and method of use. 3,947,408, Cl. 260-239.30T.
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Yamada, Mitsumasa; and Kitamura, Youji, to Nippondenso Co., Ltd.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Method of cleaning exhaust gases. 3,947,544, Cl. 423-212.000.
Yamada, Yoshihiro. Automatic photograph printing control system. 3,947,110, Cl. 355-38.000.
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Yamamoto, Kiichiro; and Toyosumi, Shigeru, to Sumitomo Shipbuilding & Machinery Co., Ltd. Gear with a trochoidal curved disk. 3,946,620, Cl. 74-462.000.
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Yamanouchi, Atsuo, to Hitachi, Ltd. Apparatus for purifying sodium. 3,947,334, Cl. 204-140.000.
Yamasaki, Tatsuo; Ide, Hideaki; Yamaguchi, Yoshihiro; Matsushita, Tomiharu; and Nakahara, Yuuzi, to Kobe Steel, Ltd. Hydrostatic extrusion method and apparatus. 3,946,584, Cl. 72-60.000.
Yamazaki, Hironobu; Kubota, Reizo; Uchida, Yoshiaki; Kasuya, Taro; and Seki, Norikazu, to Tekken Kensetu Co. Ltd. Apparatus and method of measuring fluctuations of excavated mud amount in a slurry line. 3,946,605, Cl. 73-155.000.
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Yashica Co., Ltd.: *See*—
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Yasuda, Kazuyoshi; Tsuboi, Tokishige; and Sudo, Masashi, to Shimizu Construction Co., Ltd., The. Apparatus for producing precast concrete members. 3,947,171, Cl. 425-88.000.

Yatsuo, Tsutomu; Kamei, Tatsuya; and Wajima, Koichi, to Hitachi, Ltd. Diode-integrated thyristor. 3,947,864, Cl. 357-39.000.
Yeda Research and Development Co. Ltd.: *See—*
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Ylitalo, Howard M. Toy stick amusement device. 3,946,518, Cl. 46-47.000.
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Yokota, Tadashi; Yanagi, Chiaki; and Hara, Toyoji, to Clarion Co., Ltd. Tape recorder. 3,947,884, Cl. 360-96.000.
Yokoyama, Shizuo, to Ricoh Co., Ltd. Comma printing mechanism. 3,946,666, Cl. 101-99.000.
Yoon, Jong Un. Toothpaste dispensing apparatus. 3,946,908, Cl. 222-162.000.
Yoscak, John L.: *See—*
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Young, Murray Moo. Fermentation processes. 3,947,323, Cl. 195-65.000.
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Yumde, Yasufumi; Nabeyama, Hiroaki; and Masuda, Michio, to Hitachi, Ltd. Receiving system for auxiliary information signal transmitted during the vertical blanking period of a television signal. 3,947,870, Cl. 358-4.000.
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Zahid, Abduz: *See—*
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Zankl, Robert H. Re-usable electrical fuse. 3,947,798, Cl. 337-228.000.
Zeller, Josef: *See—*
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Zeller, Miles. Service clamp. 3,947,010, Cl. 269-100.000.
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Zevco Enterprises, Inc.: *See—*
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Zhuchkov, Ivan Ilich; Filonov, Viktor Sergeevich; Zaitsev, Boris Ivanovich; Artemiev, Lev Nikolaevich; and Rakhimov, Vladimir Vildanovich. Liquid-metal-cooled reactor. 3,947,318, Cl. 176-19.00R.
Zhuk, Regina Abramovna: *See—*
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Zigmant, Frank. Trailer angular direction sensor and indicator. 3,947,839, Cl. 340-282.000.
Zimmer, Russell D.; and Traver, William S., to Pulse Dynamics Manufacturing Corporation. Bolt mechanism with manual override. 3,947,060, Cl. 292-142.000.
Zimmermann, Manfred: *See—*
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Zimmermann, Robert E., to Koppers Company, Inc. Hot blast stove. 3,947,245, Cl. 432-217.000.
Zimmermann, Werner, to Windmoller & Holscher. Rotary film blowhead for making tubular films of thermoplastic material. 3,947,170, Cl. 425-72.00R.
Zinn, Walter H., to United States of America, Energy Research & Development Administration. Nickel container of highly-enriched uranium bodies and sodium. 3,947,320, Cl. 176-72.000.
Zinser, Paul F. Hose roller. 3,946,964, Cl. 242-86.000.
Zinsstag, Christoph: *See—*
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Zirngibl, Ludwig; Adrian, Rudolf; and Jahn, Ulrich, to Siegfried Aktiengesellschaft. Novel indolyl alkyl amines, method of producing same, and their use as anorectic agents. 3,947,584, Cl. 424-274.000.
Zobacheva, Maiva Mikhailovna: *See—*
Perekalin, Vsevolod Vasilievich; Sopova, Alexandra Semenovna; Zobacheva, Maiva Mikhailovna; Spunde, Rasma Yanovna; Mikstais, Uldis Yanovich; and Silaya, Maiya Petrovna, 3,947,492.
Zook, Lewis J.: *See—*
Frech, Louis W.; Hubble, David H.; and Zook, Lewis J., 3,947,002.
Zunkel, Alan Douglas, to St. Joe Minerals Corporation. Method of removing mercury from sulfuric acid. 3,947,561, Cl. 423-531.000.
Zwack, Robert R.: *See—*
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LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 30TH DAY OF MARCH, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Balamuth, Lewis; Kuris, Arthur; and Karatjas, Manual, to Ultrasonic Systems, Inc. Ultrasonic kits and motor systems. Re. 28,752, Cl. 318-116.000.

Ball, Jack, to Varian Associates. X- and gamma-ray sensitive image intensification tube. Re. 28,751, Cl. 250-213.0VT.

Bruce, Peter. Chain cable. Re. 28,746, Cl. 59-78.000.

Continental Oil Company: *See*—
Zavodny, Alfred T., Re. 28,753.

Cook, Kenneth J.; and Horwitz, Norman H., to William Beaumont Hospital. Bed egress alarm circuit. Re. 28,754, Cl. 340-279.000.

Douglass, James C., to H. R. Electronics Company. Coin controlled means for vending machines and the like. Re. 28,749, Cl. 194-1.00N.

Fredrickson, Wallace F., to Muncher Corporation. Baler. Re. 28,748, Cl. 100-218.000.

Graboyes, Herman, to Numerical Control Program Service, Inc. Method and apparatus for engraving characters. Re. 28,747, Cl. 90-13.00C.

H. R. Electronics Company: *See*—
Douglass, James C., Re. 28,749.

Horwitz, Norman H.: *See*—
Cook, Kenneth J.; and Horwitz, Norman H., Re. 28,754.

Karatjas, Manual: *See*—
Balamuth, Lewis; Kuris, Arthur; and Karatjas, Manual, Re. 28,752.

Kuris, Arthur: *See*—
Balamuth, Lewis; Kuris, Arthur; and Karatjas, Manual, Re. 28,752.

Le Troadec, Yves, to Rhone-Poulenc S. A. Method of fitting pressurized spraying containers. Re. 28,750, Cl. 264-98.000.

Muncher Corporation: *See*—
Fredrickson, Wallace F., Re. 28,748.

Numerical Control Program Service, Inc.: *See*—
Graboyes, Herman, Re. 28,747.

Rhone-Poulenc S. A.: *See*—
Le Troadec, Yves, Re. 28,750.

Ultrasonic Systems, Inc.: *See*—
Balamuth, Lewis; Kuris, Arthur; and Karatjas, Manual, Re. 28,752.

Varian Associates: *See*—
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43C	3,946,648
56	3,946,649
115K	3,946,650

CLASS 99

323	3,946,652
340	3,946,653
403	3,946,654
404	3,946,655
444	3,946,651
450.6	3,946,656
455	3,946,657
627	3,946,658

CLASS 100

4	3,946,659
39	3,946,660
53	3,946,661
218	Re.28,748
240	3,946,662

CLASS 101

3R	3,946,663
41	3,946,664
45	3,946,665
99	3,946,666
123	3,946,667
	3,946,668
230	3,946,669
378	3,946,670
426	3,946,671

CLASS 102

49.4	3,946,672
52	3,946,673
70.2G	3,946,675
70.2P	3,946,674

CLASS 105

169	3,946,676
224.1	3,946,677

CLASS 106

15FP	3,947,276
26	3,947,277
	3,947,278
39.6	3,947,279
45	3,947,280
52	3,947,281
54	3,947,282
89	3,947,283
	3,947,284
111	3,947,285
286	3,947,286
308Q	3,947,287
314	3,947,288

CLASS 108

44	3,946,678

CLASS 110

8C	3,946,679
18C	3,946,680

CLASS 111

7	3,946,681

CLASS 112

217.1	3,946,682

CLASS 113

15A	3,946,683

CLASS 114

.5D	3,946,684
16E	3,946,685
29	3,946,686
56	3,946,687
66.5H	3,946,688
67A	3,946,689
144E	3,946,690
	3,946,691
165	3,946,693
183R	3,946,694
206R	3,946,695
221R	3,946,696
222	3,946,692

CLASS 115

.5E	3,946,697
35	3,946,698

CLASS 116

174	3,946,699

CLASS 118

259	3,946,700

CLASS 119

18	3,946,701
51.13	3,946,702
75	3,946,703

CLASS 123

32EA	3,946,704
41.13	3,946,705
56BC	3,946,706
102	3,946,707
117R	3,946,708
	3,946,709
119B	3,946,710
119E	3,946,711
139AD	3,946,713
139AF	3,946,712
139AW	3,946,714
140A	3,946,716
140R	3,946,715
141	3,946,717

CLASS 124

30R	3,946,718

CLASS 126

91A	3,946,719
270	3,946,720
	3,946,721
343.5A	3,946,722

CLASS 128

2.05E	3,946,724
2.06E	3,946,730
2.06R	3,946,725
2.08	3,946,726
2.1M	3,946,723
4	3,946,727
69	3,946,728
145.8	3,946,729
214R	3,946,731
218M	3,946,732
254	3,946,733
260	3,946,734
278	3,946,735
	3,946,736
285	3,946,737
303.14	3,946,738
304	3,946,739
334R	3,946,740
347	3,946,741
351	3,946,742
404	3,946,743
419PT	3,946,744
421	3,946,745

CLASS 130

27P	3,946,746

CLASS 131

46	3,946,747
261R	3,946,748

CLASS 132

7	3,946,749

CLASS 134

104	3,946,750

CLASS 136

6FS	3,946,751
6LF	3,947,291
6LN	3,947,289
25	3,947,292
134R	3,947,290

CLASS 137

246	3,946,752
268	3,946,753
315	3,946,754
493	3,946,755
495	3,946,756
501	3,946,757
590	3,946,758

CLASS 138

30	3,946,759
31	3,946,760
98	3,946,761
140	3,946,762
147	3,946,763
148	3,946,764

CLASS 139

12	3,946,765
66R	3,946,766
122H	3,946,767

CLASS 140

92.1	3,946,768
93.2	3,946,769

CLASS 141

5	3,946,770
59	3,946,771
98	3,946,772
206	3,946,773

CLASS 142

26	3,946,774

CLASS 144

34A	3,946,775
34E	3,946,776
90A	3,946,777

CLASS 145

31A	3,946,778
46	3,946,779

CLASS 148

12C	3,947,294
12F	3,947,293
31.57	3,947,295
111	3,947,296
157	3,947,299
159	3,947,297
175	3,947,298

CLASS 149

35	3,947,300
43	3,947,301

CLASS 150

8	3,946,780
35	3,946,781

CLASS 152

330L	3,946,783
330R	3,946,782
352R	3,946,784
354	3,946,785

CLASS 156

3	3,947,302
	3,947,303

13 3,947,304
62.4 3,947,305
72 3,947,306
73.1 3,947,307
133 3,947,308
248 3,947,309
289 3,947,310
357 3,947,311
415 3,947,312
584 3,947,313

CLASS 157
1.24 3,946,786
3,946,787

CLASS 160
84R 3,946,788
166A 3,946,789
206 3,946,790
345 3,946,791

CLASS 162
55 3,947,314
101 3,947,315
129 3,947,316
263 3,947,317

CLASS 164
4 3,946,792
54 3,946,793
82 3,946,794
154 3,946,795
200 3,946,796
282 3,946,797
3,946,798
286 3,946,799

CLASS 165
1 3,946,800
32 3,946,801
35 3,946,802
87 3,946,803
167 3,946,804

CLASS 166
.6 3,946,805
55 3,946,806
123 3,946,807
245 3,946,808
248 3,946,809
272 3,946,810
274 3,946,811
3,946,812
307 3,946,813
308 3,946,814

CLASS 172
17 3,946,815
65 3,946,816

CLASS 174
15S 3,947,622
146 3,947,623

CLASS 175
209 3,946,818
296 3,946,819
341 3,946,820
374 3,946,817

CLASS 176
19R 3,947,318
65 3,947,319
72 3,947,320
87 3,947,321
3,947,322

CLASS 177
227 3,946,821

CLASS 178
6 3,947,624
6.6DD 3,947,625
6.6R 3,947,626
6.8 3,947,628
7.1 3,947,627
3,947,630
7.3R 3,947,629
3,947,631
7.5 3,947,632
67 3,947,633
69.5DC 3,947,634

CLASS 179
1CN 3,947,639
1GQ 3,947,637
1SA 3,947,638
1E 3,947,635
1P 3,947,636
2A 3,947,641
6R 3,947,642
6.3R 3,947,643
15BT 3,947,645
100.3B 3,947,640
110A 3,947,644
146R 3,947,646
179 3,947,647

CLASS 180
9.46 3,946,822
23 3,946,823
27 3,946,824
79.2R 3,946,825
90 3,946,826
3,946,827
128 3,946,828

CLASS 181
33HA 3,946,830
120 3,946,831
142 3,946,829
167 3,946,832

CLASS 182
20 3,946,833
164 3,946,834

CLASS 184
7D 3,946,835

CLASS 187
8 3,946,836

CLASS 188
72.4 3,946,837
170 3,946,838

CLASS 190
18A 3,946,839

CLASS 192
3.58 3,946,842
18A 3,946,840
35 3,946,841
45.1 3,946,843
67R 3,946,844
111A 3,946,845

CLASS 194
1A 3,946,846
1N Re.28,749
57 3,946,847
94 3,946,848
97B 3,946,849

CLASS 195
65 3,947,323
66R 3,947,324
68 3,947,325

CLASS 196
110 3,947,326

CLASS 197
1R 3,946,850
3,946,851
53 3,946,852

CLASS 198
16R 3,946,853
21 3,946,854
34 3,946,855
84 3,946,856
189 3,946,857
192R 3,946,858
203 3,946,859
204 3,946,860
208 3,946,861

CLASS 200
5R 3,947,390
16D 3,947,391
82D 3,947,648
144R 3,947,649
148B 3,947,650
314 3,947,651

CLASS 203
7 3,947,327

CLASS 204
1T 3,947,328
9 3,947,348
17 3,947,330
37R 3,947,331
86 3,947,332
129 3,947,333
140 3,947,334
158HA 3,947,336
158R 3,947,335
159.15 3,947,337
159.17 3,947,525
181 3,947,338
3,947,339
3,947,340
3,947,341
192 3,947,342
207 3,947,343
286 3,947,344
299R 3,947,345

CLASS 206
150 3,946,862
216 3,946,863
332 3,946,864
387 3,946,865
392 3,946,866
450 3,946,867
455 3,946,868
466 3,946,869
471 3,946,870
498 3,946,871
3,946,872
521 3,946,873
523 3,946,874

CLASS 208
10 3,947,346
251H 3,947,347

CLASS 209
115 3,946,875
214 3,947,349

CLASS 210
10 3,947,350
22R 3,947,351
31C 3,947,352
52 3,947,353
53 3,947,354
83 3,947,355
96R 3,947,356
170 3,947,357
194 3,947,358
221P 3,947,359
242S 3,947,360
294.8G 3,947,463
391 3,947,361
416 3,947,362
510 3,947,363
512R 3,947,364

CLASS 211
60R 3,946,876
65 3,946,877
124 3,946,878

CLASS 214
6N 3,946,879
8.5R 3,946,880
15R 3,946,881
147G 3,946,882
152 3,946,883
3,946,884
302 3,946,885
334 3,946,886
653 3,946,887

CLASS 215
11B 3,946,888
219 3,946,889
220 3,946,890
256 3,946,891

CLASS 219
10.79 3,947,652
76 3,947,653
121LM 3,947,654
146 3,947,655
243 3,947,656
362 3,947,659
454 3,947,657
504 3,947,658

CLASS 220
9B 3,946,892
13 3,946,893
256 3,946,894
269 3,946,895
273 3,946,896
306 3,946,897
325 3,946,898

CLASS 221
225 3,946,899

CLASS 222
20 3,946,900
56 3,946,901
64 3,946,902
92 3,946,903
102 3,946,904
107 3,946,905
135 3,946,906
152 3,946,907
162 3,946,908
181 3,946,909
238 3,946,910
402.11 3,946,911
402.13 3,946,912
453 3,946,913
574 3,946,914

CLASS 223
96 3,946,915

CLASS 224
25A 3,946,916
42.1R 3,946,917

CLASS 226
1 3,946,918
11 3,946,919
39 3,946,920
43 3,946,921
91 3,946,922
168 3,946,923
176 3,946,924

CLASS 227
60 3,946,925
112 3,946,926
126 3,946,927

CLASS 228
3.1 3,946,928
15.1 3,946,929
41 3,946,930
102 3,946,931
121 3,946,932
212 3,946,933

CLASS 229
23R 3,946,934
37R 3,946,935
38 3,946,936
51TC 3,946,937
73 3,946,938

CLASS 232
17 3,946,939

CLASS 233
2 3,946,940
26 3,946,941
40 3,946,942

CLASS 235
61.11D 3,947,663
61.11E 3,947,662
3,947,666
61.6R 3,947,660
61.7R 3,947,661
92PL 3,947,664
150.1 3,947,665
151.11 3,947,667
151.12 3,947,668
156 3,947,669
164 3,947,670
175 3,947,671
181 3,947,672
3,947,673
3,947,674
184 3,947,675

CLASS 236
34.5 3,946,943

CLASS 237
1A 3,946,944

CLASS 239
58 3,946,945
177 3,946,946
401 3,946,947
453 3,946,948
600 3,946,949

CLASS 240
6.4W 3,947,676
8.1R 3,947,677
11.4R 3,947,678
47 3,947,679
62.3 3,947,680

CLASS 241
18 3,946,950
21 3,946,951
56 3,946,952
79.2 3,946,953
3,946,954
264 3,946,955

CLASS 242
26.1 3,946,956
43R 3,946,957
46.3 3,946,958
55.19A 3,946,959
65 3,946,960
67.1R 3,946,961
68.3 3,946,962
84.21R 3,946,963
86 3,946,964
107.4R 3,946,965
191 3,946,966

CLASS 244
3.2 3,946,967
3.21 3,946,968
3.28 3,946,969
23C 3,946,970
137R 3,946,971

CLASS 246
34CT 3,946,972
182BH 3,946,973
415R 3,946,974

CLASS 248
1 3,946,975
18 3,946,976
126 3,946,977
264 3,946,978
274 3,946,979
443 3,946,980

CLASS 249
79 3,946,981
102 3,946,982

CLASS 250
211J 3,947,681
213VT Re.28,751
231R 3,947,682
270 3,947,683
369 3,947,684
373 3,947,685
439 3,947,686
492A 3,947,687
495 3,947,688
512 3,947,689
513 3,947,690
566 3,947,691
577 3,947,692

CLASS 251
61.2 3,946,983
130 3,946,984
3,946,985
298 3,946,986

CLASS 252
5 3,947,365
8.6 3,947,366
51.5A 3,947,367
56R 3,947,368
57 3,947,369
62.1P 3,947,370
3,947,371
62.57 3,947,372
63.2 3,947,373
102 3,947,374
299 3,947,375
313S 3,947,376
408 3,947,377
3,947,378
462 3,947,380
463 3,947,379
465 3,947,486
466B 3,947,381
542 3,947,382

CLASS 254
10.5 3,946,987
30 3,946,988
157 3,946,989
164 3,946,990
166 3,946,991

CLASS 256
68 3,946,992

CLASS 259
4R 3,946,993
7 3,946,994
9 3,946,995
10 3,946,996
45 3,946,997
191 3,946,998
3,946,999
192 3,947,000

CLASS 260
2BP 3,947,383
2N 3,947,384
2.5AH 3,947,386
2.5BB 3,947,389
2.5N 3,947,385
2.5R 3,947,387
3,947,388
17.4GC 3,947,392
19N 3,947,393
23.7A 3,947,394
28P 3,947,395
29.3 3,947,396
29.6TA 3,947,400
29.6E 3,947,399
29.6H 3,947,401
29.6M 3,947,397
29.6S 3,947,398
30.2 3,947,402
32.8N 3,947,403
38 3,947,420
40R 3,947,421
42.52 3,947,422
45.75C 3,947,424
45.8R 3,947,423
51.5 3,947,425
77.5TB 3,947,426
77.5R 3,947,427
78L 3,947,428
79.3R 3,947,432
79.5B 3,947,429
79.5P 3,947,430
85SS 3,947,431
88.2R 3,947,433
155 3,947,434
190 3,947,435
210F 3,947,405
210.5 3,947,404
239EQ 3,947,407
239.3A 3,947,406
239.3T 3,947,408
239.55R 3,947,409
240D 3,947,410
240R 3,947,411
243C 3,947,413
3,947,414
3,947,415
244R 3,947,416
3,947,417
246B 3,947,418
248C 3,947,419
249.5 3,947,436
250QN 3,947,438
250A 3,947,437
251A 3,947,439
256.4C 3,947,440
256.4F 3,947,442
256.4N 3,947,441
257 3,947,443
260 3,947,444
268BC 3,947,446
268BF 3,947,445
268TR 3,947,447
268R 3,947,448
279R 3,947,449
281NH 3,947,452
281R 3,947,451
281Z 3,947,450
287AZ 3,947,453
287CF 3,947,454
288R 3,947,455
289R 3,947,456
290HL 3,947,457
293.51 3,947,458
293.57 3,947,459
293.76 3,947,460
295F 3,947,462
299 3,947,461
306.7C 3,947,464
307C 3,947,465
308R 3,947,466
308 3,947,412
310R 3,947,467
327TH 3,947,468
327M 3,947,469
330.5 3,947,470
335 3,947,471
340.9 3,947,472
345.5 3,947,473
346.8A 3,947,474
347.3 3,947,475
348.5V 3,947,476
380 3,947,477
397.3 3,947,478
397.4 3,947,479
397.6 3,947,480
429.7 3,947,481
448C 3,947,482
449M 3,947,483
453PH 3,947,484
455A 3,947,485
465.003 3,947,487
473A 3,947,488
488F 3,947,490
488H 3,947,489
501.15 3,947,491
518R 3,947,492
3,947,493
524R 3,947,494
533N 3,947,495
534R 3,947,496
541 3,947,497
543R 3,947,512
545R 3,947,511
551S 3,947,513
558R 3,947,514
559AT 3,947,517
559S 3,947,515
3,947,516
561N 3,947,518
586R 3,947,519
590D 3,947,520
593R 3,947,521
611V 3,947,498
614R 3,947,499
618H 3,947,500
3,947,501
635E 3,947,503
643A 3,947,504
652P 3,947,508
654R 3,947,505
676R 3,947,509
677H 3,947,510
681.5R 3,947,506
683.15B 3,947,507
837R 3,947,522
3,947,523
873 3,947,524
878R 3,947,526
879 3,947,527
901 3,947,528
940 3,947,529

CLASS 261
7 3,947,530
39B 3,947,531
112 3,947,532

CLASS 264
24 3,947,533
62 3,947,534
87 3,947,535
95 3,947,536
98 Re.28,750
137 3,947,537
290T 3,947,538
320 3,947,539
326 3,947,540
332 3,947,541

CLASS 266
20 3,947,001
43 3,947,002

CLASS 267
64R 3,947,003
65R 3,947,004
119 3,947,005
120 3,947,006
136 3,947,007
137 3,947,008
3,947,009

CLASS 269
100 3,947,010
249 3,947,011
289R 3,947,012

CLASS 270
79 3,947,013
84 3,947,014

CLASS 271

9 3,947,015
12 3,947,016
99 3,947,017
3,947,018
172 3,947,020
174 3,947,019
182 3,947,021
250 3,947,022

CLASS 272

57R 3,947,023
60R 3,947,024
83R 3,947,025

CLASS 273

2 3,947,026
33 3,947,027
41 3,947,028
73D 3,947,029
85C 3,947,031
85R 3,947,030
95F 3,947,032
105.2 3,947,033
123R 3,947,034
126R 3,947,035
130E 3,947,036
131D 3,947,037
134AC 3,947,038
134CF 3,947,039
137R 3,947,040
167G 3,947,041

CLASS 274

9A 3,947,042
10R 3,947,043

CLASS 277

3 3,947,044
87 3,947,045
235A 3,947,046

CLASS 279

1B 3,947,047
41A 3,947,048

CLASS 280

11.13S 3,947,049
11.18 3,947,050
11.35K 3,947,052
3,947,053
11.35R 3,947,051
36C 3,947,054
47.15 3,947,055
150AB 3,947,057
150SB 3,947,058
150B 3,947,056
289 3,947,059

CLASS 292

142 3,947,060

CLASS 293

5 3,947,061
69R 3,947,062

CLASS 294

16 3,947,063
67E 3,947,064

CLASS 296

1S 3,947,065
27 3,947,066

CLASS 297

84 3,947,067
317 3,947,069
445 3,947,068

CLASS 301

37SA 3,947,070

CLASS 302

59 3,947,071

CLASS 303

13 3,947,072
21R 3,947,073

CLASS 305

54 3,947,074

CLASS 307

10AT 3,947,693
11 3,947,694
85 3,947,695
116 3,947,696
208 3,947,697
221D 3,947,698
235N 3,947,699
237 3,947,700
264 3,947,701
271 3,947,702
297 3,947,703
3,947,704
304 3,947,705
310 3,947,706
311 3,947,707

CLASS 308

72 3,947,075
103 3,947,076
187.1 3,947,077
207R 3,947,078
228 3,947,079

CLASS 310

8.1 3,947,708
87 3,947,709
153 3,947,710
155 3,947,711
168 3,947,712

CLASS 313

174 3,947,713
225 3,947,714
270 3,947,715
336 3,947,716
386 3,947,717
408 3,947,718
489 3,947,719

CLASS 315

151 3,947,720
169TV 3,947,721
3,947,722
389 3,947,723
410 3,947,724

CLASS 317

12B 3,947,725
16 3,947,726
31 3,947,727
47 3,947,728
61.5 3,947,729
3,947,730
70 3,947,867
81 3,947,731
122 3,947,732
132 3,947,733
146 3,947,734
230 3,947,735

CLASS 318

116 Re.28,752
227 3,947,736
257 3,947,737
341 3,947,738
376 3,947,739
3,947,740
588 3,947,741
611 3,947,742

CLASS 320

2 3,947,743
61 3,947,744

CLASS 321

2 3,947,745
3,947,746
3,947,747
11 3,947,748
47 3,947,749

CLASS 323

1 3,947,750
9 3,947,751
17 3,947,752
21 3,947,753
22SC 3,947,754
43.5S 3,947,755

CLASS 324

1 3,947,756
28R 3,947,757
3,947,758
29 3,947,329
51 3,947,759
57R 3,947,760
103P 3,947,761
142 3,947,762
3,947,763
158MG 3,947,764
158R 3,947,765

CLASS 325

25 3,947,766
38A 3,947,767
42 3,947,768
320 3,947,769
363 3,947,770
404 3,947,771
422 3,947,772
464 3,947,773
470 3,947,774

CLASS 328

133 3,947,775
147 3,947,776

CLASS 329

122 3,947,777

CLASS 330

10 3,947,779
30D 3,947,778

CLASS 331

94.5C Re.28,753
94.5D 3,947,781
94.5M 3,947,780

CLASS 332

29M 3,947,782

CLASS 333

30R 3,947,783
72 3,947,784
98R 3,947,785

CLASS 334

7 3,947,786
51 3,947,787

CLASS 335

68 3,947,788
74 3,947,789
75 3,947,790
167 3,947,791
201 3,947,792
210 3,947,793
217 3,947,794

CLASS 336

184 3,947,795
192 3,947,796

CLASS 337

31 3,947,797
228 3,947,798

CLASS 338

9 3,947,799
163 3,947,800
308 3,947,801

CLASS 339

64M 3,947,080
75M 3,947,081
97R 3,947,082
258P 3,947,083

CLASS 340

6R 3,947,803
3,947,804
3,947,805
10 3,947,802
15.5GC 3,947,806
23 3,947,807
27AT 3,947,808
3,947,809
3,947,810
52D 3,947,812
52F 3,947,811
59 3,947,813
62 3,947,814
88 3,947,815
146.3MA 3,947,817
146.3Z 3,947,816
147LP 3,947,818
147P 3,947,819
149A 3,947,820
172.5 3,947,821
3,947,822
3,947,823
3,947,824
3,947,825
173RC 3,947,827
173R 3,947,826
3,947,828
173.5P 3,947,829
174BC 3,947,831
174TF 3,947,830
224 3,947,832
253B 3,947,859
258A 3,947,834
258R 3,947,833
261 3,947,835
270 3,947,836
274R 3,947,837
276 3,947,838
279 Re.28,754
282 3,947,839
324M 3,947,840
3,947,841
324R 3,947,842
347P 3,947,843
380 3,947,844

CLASS 343

6.5LC 3,947,845
18E 3,947,846
3,947,847
3,947,848
103 3,947,849
795 3,947,850

CLASS 346

1 3,947,851
74EB 3,947,852
75 3,947,853
76R 3,947,854

CLASS 350

2 3,947,084
3.5 3,947,085
36 3,947,086
96WG 3,947,087
96C 3,947,088
3,947,182
151 3,947,089
160LC 3,947,090
3,947,091
3,947,183
3,947,184
3,947,185
171 3,947,092
189 3,947,093
214 3,947,094
302 3,947,095
3,947,096

CLASS 351

17 3,947,097
3,947,186
30 3,947,098
35 3,947,099
120 3,947,100

CLASS 352

72 3,947,187
187 3,947,101

CLASS 353

27A 3,947,102
38 3,947,189
66 3,947,103
76 3,947,188
78 3,947,104
121 3,947,105

CLASS 354

50 3,947,855
195 3,947,860
217 3,947,861
234 3,947,857
3,947,858
289 3,947,862
324 3,947,856

CLASS 355

1 3,947,106
3DD 3,947,107
3R 3,947,113
3,947,190
4 3,947,114
8 3,947,115
15 3,947,108
29 3,947,109
38 3,947,110
40 3,947,116
50 3,947,111
68 3,947,112
3,947,117
77 3,947,118

CLASS 356

5 3,947,119
30 3,947,120
38 3,947,121
39 3,947,123
41 3,947,122
71 3,947,121
74 3,947,124
85 3,947,125
124 3,947,127
150 3,947,126
159 3,947,125
167 3,947,130
209 3,947,131

CLASS 357

24 3,947,863
39 3,947,864
46 3,947,865
49 3,947,869
51 3,947,866
81 3,947,868

CLASS 358

4 3,947,870
8 3,947,871

CLASS 360

16 3,947,872
36 3,947,874
38 3,947,873
39 3,947,875
40 3,947,876
48 3,947,877
51 3,947,878
56 3,947,879
71 3,947,880
78 3,947,881
92 3,947,882
93 3,947,883
96 3,947,884
98 3,947,885
99 3,947,886
103 3,947,887
3,947,888
113 3,947,889
114 3,947,890
118 3,947,891
132 3,947,892
133 3,947,893
137 3,947,894
3,947,895

CLASS 401

7 3,947,132
54 3,947,133
118 3,947,134
121 3,947,135
188A 3,947,136
217 3,947,137

CLASS 402

69 3,947,138

CLASS 403

90 3,947,139
108 3,947,140
109 3,947,141
334 3,947,191

CLASS 404

41 3,947,192
126 3,947,142

CLASS 408

230 3,947,143
235 3,947,144

CLASS 415

1 3,947,146
113 3,947,147
119 3,947,148
143 3,947,193
213T 3,947,149
217 3,947,145
219R 3,947,150

CLASS 416

93A 3,947,151

CLASS 417

212 3,947,194
360 3,947,152
365 3,947,153
373 3,947,154
417 3,947,155
437 3,947,156
554 3,947,158
559 3,947,157

CLASS 418

60 3,947,159
3,947,160
113 3,947,161
121 3,947,162
203 3,947,163
233 3,947,164

CLASS 423

18 3,947,542
22 3,947,543
212 3,947,544
213.7 3,947,545
242 3,947,546
3,947,547
299 3,947,548
3,947,549
345 3,947,550
359 3,947,551
379 3,947,552
395 3,947,553
403 3,947,554
440 3,947,555
463 3,947,556
3,947,557
483 3,947,558
515 3,947,559
522 3,947,560
531 3,947,561
630 3,947,562
632 3,947,502
636 3,947,563

CLASS 424

1 3,947,564
9 3,947,569
45 3,947,566
3,947,567
47 3,947,568
54 3,947,570
64 3,947,571
79 3,947,572
80 3,947,573
127 3,947,574
177 3,947,575
200 3,947,565
204 3,947,584
263 3,947,576
3,947,577
267 3,947,578
3,947,579
270 3,947,580
3,947,581
272 3,947,582
273 3,947,583
3,947,585
283 3,947,588
285 3,947,587
317 3,947,588
319 3,947,589
3,947,590
326 3,947,591
330 3,947,592
3,947,593
331 3,947,594
342 3,947,595
344 3,947,596

CLASS 425

3 3,947,165
7 3,947,166
64 3,947,167
71 3,947,168
3,947,169
72R 3,947,170
3,947,174
88 3,947,171
113 3,947,172
3,947,173
127 3,947,199
130 3,947,175
3,947,176
3,947,177
131.1 3,947,200
132 3,947,178
147 3,947,201
185 3,947,202
190 3,947,195
223 3,947,179
242B 3,947,180
3,947,181
245R 3,947,203
248 3,947,196
324B 3,947,197
327 3,947,198
383 3,947,204
387B 3,947,205
388 3,947,206
398 3,947,207
436R 3,947,208
440 3,947,209
441 3,947,210
447 3,947,211
451.9 3,947,212
3,947,213
467 3,947,214

CLASS 426

27 3,947,597
36 3,947,598
250 3,947,599
302 3,947,600
330.1 3,947,601
417 3,947,602
538 3,947,603
573 3,947,604
656 3,947,605

CLASS 427

37 3,947,607
50 3,947,606
64 3,947,608
68 3,947,609
142 3,947,610
177 3,947,611
222 3,947,612
242 3,947,613
284 3,947,614
398 3,947,615
430 3,947,616

CLASS 428

35 3,947,617
49 3,947,618
57 3,947,619
68 3,947,620

CLASS 431

5 3,947,215
12 3,947,217
79 3,947,218
3,947,219
80 3,947,220
93 3,947,221
3,947,222
94 3,947,223
3,947,224
95R 3,947,225
114 3,947,226
118 3,947,227
121 3,947,228
125 3,947,229
168 3,947,230
285 3,947,231
288 3,947,232
328 3,947,233
352 3,947,216

CLASS 432

2 3,947,234
3,947,235
11 3,947,236
3,947,237
14 3,947,238
3,947,239
28 3,947,240
121 3,947,241
122 3,947,242
124 3,947,243
205 3,947,244
217 3,947,245

D2—	272	239,340		191	239,354		143	239,368		F	239,382		R	239,394		4B	239,408
	275	239,341			239,355		164	239,369		R	239,380	D30—	41	239,395		R	239,407
	310	239,342		203	239,356		237	239,370	D19—	59	239,383	D32—	1A	239,396			239,409
	315	239,343		248	239,357		245	239,371		62	239,384	D34—	2D	239,397		9	239,410
D6—	3	239,344	D7—	6	239,358		276	239,372	D22—	201.3	239,385		3R	239,405			239,411
	26	239,345		59	239,359	D10—	38	239,373	D23—	17	239,386		5GC	239,401			239,412
	29	239,346	D8—	15	239,360	D12—	53	239,374		127	239,387		GH	239,402	D57—	1B	239,413
	97	239,347		31	239,361		64	239,375		163	239,388		TT	239,400	D61—	J	239,414
	136	239,348		42	239,362		136	239,376			239,389		K	239,398	D64—	12B	239,415
	152	239,349		70	239,363		159	239,377	D24—	1D	239,390			239,399	D83—	1J	239,416
	161	239,350		235	239,364		203	239,378	D26—	A	239,391		15LL	239,404		L	239,417
	166	239,351		260	239,365		205	239,379		5C	239,392		PP	239,403	D87—	D	239,419
	179	239,352	D9—	47	239,366	D13—	1B	239,381		13	239,393	D56—	1A	239,406		R	239,418
	189	239,353		60	239,367												

CLASSIFICATION OF PLANTS

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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 : 3,946,638	3,946,856	3,947,479	3,947,875	3,947,790	3,947,074		
3,946,703	3,946,861	3,947,481	3,947,879	3,947,798	3,947,076		
3,946,967	3,946,891	3,947,526	3,947,886	3,947,802	3,947,077		
3,946,990	3,946,893	3,947,564	3,947,887	3,947,882	3,947,080		
4 : 3,946,617	3,946,903	3,947,601	9 : 3,946,486	13 : 3,946,718	3,947,095		
3,947,045	3,946,909	3,947,611	3,946,511	3,947,172	3,947,161		
3,947,100	3,946,910	3,947,666	3,946,525	3,947,173	3,947,165		
3,947,682	3,946,915	3,947,668	3,946,551	16 : 3,947,309	3,947,205		
3,947,752	3,946,969	3,947,675	3,946,553	17 : 3,946,453	3,947,219		
3,947,754	3,946,970	3,947,694	3,946,685	3,946,460	3,947,240		
3,947,765	3,947,003	3,947,704	3,946,693	3,946,502	3,947,255		
3,947,778	3,947,010	3,947,723	3,946,731	3,946,513	3,947,277		
3,947,863	3,947,023	3,947,733	3,946,863	3,946,519	3,947,278		
5 : 3,946,579	3,947,026	3,947,741	3,946,897	3,946,523	3,947,291		
6 : 3,946,441	3,947,028	3,947,750	3,946,980	3,946,535	3,947,320		
3,946,449	3,947,030	3,947,759	3,947,079	3,946,540	3,947,324		
3,946,458	3,947,031	3,947,769	3,947,104	3,946,562	3,947,329		
3,946,470	3,947,033	3,947,779	3,947,265	3,946,603	3,947,354		
3,946,476	3,947,034	3,947,787	3,947,281	3,946,614	3,947,376		
3,946,480	3,947,041	3,947,812	3,947,337	3,946,632	3,947,391		
3,946,481	3,947,054	3,947,815	3,947,363	3,946,663	3,947,392		
3,946,488	3,947,061	3,947,816	3,947,379	3,946,702	3,947,399		
3,946,489	3,947,062	3,947,826	3,947,438	3,946,722	3,947,455		
3,946,493	3,947,075	3,947,827	3,947,523	3,946,723	3,947,462		
3,946,517	3,947,081	3,947,830	3,947,568	3,946,743	3,947,494		
3,946,520	3,947,084	3,947,835	3,947,642	3,946,769	3,947,572		
3,946,532	3,947,097	3,947,838	3,947,669	3,946,771	3,947,576		
3,946,556	3,947,105	3,947,839	3,947,689	3,946,776	3,947,590		
3,946,558	3,947,127	3,947,845	3,947,797	3,946,780	3,947,605		
3,946,572	3,947,144	3,947,847	10 : 3,946,326	3,946,826	3,947,656		
3,946,575	3,947,182	3,947,850	3,946,937	3,946,859	3,947,701		
3,946,595	3,947,207	3,947,851	3,947,369	3,946,862	3,947,729		
3,946,597	3,947,236	3,947,865	3,947,511	3,946,867	3,947,732		
3,946,600	3,947,241	3,947,866	3,947,604	3,946,873	3,947,734		
3,946,607	3,947,250	3,947,867	12 : 3,946,491	3,946,876	3,947,784		
3,946,615	3,947,257	3,947,873	3,946,505	3,946,883	3,947,786		
3,946,616	3,947,298	3,947,874	3,946,574	3,946,894	3,947,795		
3,946,621	3,947,302	3,947,876	3,946,696	3,946,895	18 : 3,946,534		
3,946,649	3,947,310	3,947,888	3,946,761	3,946,898	3,946,565		
3,946,651	3,947,335	3,947,893	3,946,846	3,946,919	3,946,573		
3,946,655	3,947,342	8 : 3,946,494	3,946,848	3,946,935	3,946,701		
3,946,658	3,947,347	3,946,596	3,946,875	3,946,936	3,946,707		
3,946,673	3,947,350	3,946,679	3,946,982	3,946,947	3,946,754		
3,946,710	3,947,364	3,946,720	3,947,138	3,946,961	3,946,889		
3,946,733	3,947,380	3,946,721	3,947,210	3,946,962	3,946,964		
3,946,736	3,947,390	3,946,738	3,947,261	3,946,987	3,947,002		
3,946,755	3,947,437	3,946,741	3,947,532	3,947,036	3,947,065		
3,946,762	3,947,445	3,946,811	3,947,533	3,947,055	3,947,066		
3,946,805	3,947,461	3,946,944	3,947,634	3,947,059	3,947,078		
3,946,839	3,947,472	3,947,052	3,947,692	3,947,060	3,947,220		
3,946,844	3,947,475	3,947,119	3,947,719	3,947,070	3,947,290		

3,947,414
3,947,415
3,947,453
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19 : 3,946,496
3,946,560
3,946,886
3,946,888
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3,947,091
3,947,639
3,947,699
20 : 3,946,569
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3,946,887
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3,947,050
3,947,135
3,947,597
3,947,677
21 : 3,946,589
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27 : Re.28,748
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29 : Re.28,749
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31 : 3,946,836
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33 : 3,946,508
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34 : Re.28,747
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36 : Re.28,752
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DESIGN PATENTS

6	:	239,340			239,398			239,411		239,355	36	:	239,343			239,419
		239,353			239,399			239,412	27	: 239,386			239,344	39	:	239,367
		239,360			239,406	18	:	239,370	29	: 239,349			239,346	40	:	239,374
		239,361			239,417	19	:	239,378		239,368			239,364	41	:	239,403
		239,373	17	:	239,352	22	:	239,371	34	: 239,351			239,380	42	:	239,387
		239,375			239,363	24	:	239,401		239,357			239,382			239,390
		239,377			239,365			239,402		239,362			239,383	44	:	239,415
		239,379			239,384	25	:	239,376		239,409			239,394	48	:	239,372
		239,392			239,396	26	:	239,345		239,416			239,404	51	:	239,381
		239,393			239,397			239,354		239,418			239,413	55	:	239,359
		239,395			239,410											

PLANT PATENTS

6	:	3,855														

U. S. GOVERNMENT PRINTING OFFICE : O - 1976

U.S. DEPARTMENT OF COMMERCE
Elliot L. Richardson, Secretary

PATENT AND TRADEMARK OFFICE
C. Marshall Dann, Commissioner